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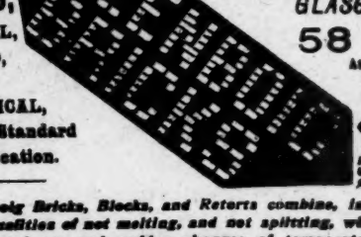

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# CONTENTS.


### EDITORIAL NOTES.

Twelve Million B.Th.U. per Ton . . . . 139
Salaries and Conditions of Technical Officers 139
Industry and the Transport Ministry—Position of Electricity . . . . . 140
The National Industrial Council . . . . 141
Private Test Results for the Gas Investigation Committee—House Connections. . . . 141
Crude Benzol and Motor Cars—The Voice of the Miners . . . . . 142

The Gas Light and Coke Company Reduce their Price . . . . . 142
Personal . . . . . 142
Obituary—John B. Scott, of Cowdenbeath . 143
Electricity Supply Memoranda . . . . . 143
Coal Tar and Some of its Products . . . 145
Drying of Sulphate of Ammonia . . . . 145
The Institution "Transactions" . . . . 145
The Part Played by Coke-Ovens and Bye-Product Plants in the Production of Munitions . . . . . 146
Toluol Recovery in the United States. . . 147
The New Manager of the National Benzol Company . . . . . 147

### CORRESPONDENCE.

Gas Investigation Committee . . . . . 147
Salaries and Service Conditions of Local Government Officers . . . . . 148
Salaries in the Gas Industry. . . . . 148
Making Gas, and Selling on a Heat-Unit Basis . . . . . 148

### REGISTER OF PATENTS.

Purifying Benzol and Washing and Mixing Two Liquids of Different Specific Gravity—Blyth, M. W., and Miles, T. V. . . . 148
Distributing Liquids in Gas Scrubbers—Dent, J. H., and the United Alkali Company, Ltd. . . . . 148
Tar Still—Archer, J. . . . . 149
Carbonization of Coal and Other Bituminous or Organic Materials—Beilby, Sir G. T. . 149
Electric Switches for Retort Plant—Drakes, Ltd., and Drake, J. W. . . . . 150
Applications for Patents . . . . . 150

### PARLIAMENTARY INTELLIGENCE.

House of Lords—
Progress of Bills. . . . . 150
South Shields Gas Bill. . . . . 150
Stourport Gas Bill . . . . . 150
House of Commons—
Progress of Bills. . . . . 150
Brentford Gas Bill . . . . . 150
London and District Lighting Regulations. 150
Report of the Coal Commission Evidence . 150
Electricity Supply Bill. . . . . 150
House of Commons Committee — Bournemouth Gas and Water Bill . . . . . 150

### MISCELLANEOUS NEWS.

The Gas of To-Day . . . . . 148
Discharge of Gas Liquor into Sewers . . . 151
The Gas Industry and Industrial Councils—Municipal and Company-Owned Undertakings . . . . . 151
Sheffield Gas Supply . . . . . 151
Gas Appliances at the National Kitchen at Glasgow . . . . . 152
Leeds Gas-Works and Durham Coal . . . 152
Bye-Product Coking in India . . . . . 153
Current Sales of Gas Products . . . . . 153
Stock Market Report . . . . . 155
Proposed Electric Light Extension at Cheltenham . . . . . 156

### PARAGRAPHS.

Eastern Counties Gas Managers' Association 142
Sir Guy Calthrop's Will—Dyestuffs Import Control . . . . . 144
Midland Junior Gas Association—Temporary Increase of Charges Act—Scottish Junior Gas Association (Eastern District) . . . 145
Tavistock Gas Company . . . . . 151
Woodall-Duckham Verticals for Dunfermline 152
Gas Supply in Perth (Western Australia)—Gas-Workers' Dispute at Tenby—Board of Trade Estimates—Price of Gas in Glasgow 154
Projected Extensions at Eyemouth—A Strike at Montreal—A Rebuff as to Gas Quality—Trim (co. Meath) Gas-Works—Threatened Strike at Goole . . . . . 155


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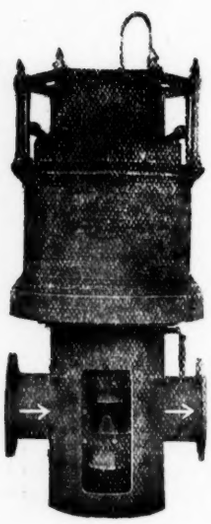

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## EDITORIAL NOTES.

### Twelve Million B.Th.U. per Ton.

IT is the universal belief now that the gas industry is well on the highway to considerable economic changes, which will help to rehabilitate its financial conditions as well as supply it with a broader commercial base, while giving the consumers more value in thermal energy for their money. Financial relief alone, to do justice to capital, will not put the industry into the position which is necessary to bring about expansion, and to meet the new conditions on which it will have to more largely rely in the future. Gas in the neighbourhood of 4s. per 1000 c.ft. is not going to popularize it in any considerable measure for domestic heating or for industrial purposes. Standards of value have in all directions gone up very substantially; but the public will not be inclined to accept gas at the price named as a reasonable standard of value for domestic heating purposes, and certainly industry will not be willing to take gas for its purposes to any considerable extent at the price named. We have already met with cases of consumers, where gas is being supplied at 4s. 4d., pursuing a very frugal course in the use of gas-fires; and instances have also been brought to notice of factories that are making inquiries as to the installation and working costs of producer gas. What is the gas industry doing to meet these conditions? Some financial relief is necessary not only from the point of view of justice to existing holders of capital, but in order to maintain the credit of the industry, and ensure capital at a fair price. But this alone is not going to provide the industry with the staple commodity that will bring to it a constantly enlarging business. Production is the direction in which we must look for the largest relief from the new financial disadvantages, and for giving fresh impetus to, and maintaining, the gas business.

Hence it is that members of the gas profession are now keenly watchful of all that is being done in increasing the thermal energy obtained in the gas produced from the coal handled; and the pity of it is that all works cannot immediately take full advantage of what has been and is being accomplished. They will have to wait their opportunity; but, though constructional costs are high, there are several wideawake engineers who have come to the conclusion that it is their business, and will be to the profit of their undertakings, to take advantage of new knowledge and developments as early as possible. The responsibility of determination is a peculiarly heavy one for the gas engineer in these times; for one course may mean irretrievable loss, the other permanent gain. But they will be assisted by the fullest publication of the results of progressive investigation. Among those who have done a considerable amount of work in this connection is Mr. Laurence Hislop, of Uddingston; and he has shown himself an intrepid investigator, by making trial flights in the steaming of vertical retorts beyond what most other men have dared to do, and has sent out into the district the gas so made to ascertain the results under the consumers' everyday working conditions. When the history of these times of exploration of, and transition in, gas manufacture comes to be written, the name of Laurence Hislop will take a prominent place in it. The tale he told during the discussion at the Informal Meeting of Scottish Gas Managers [*ante*, p. 89] made his speech the most notable of all. In March he manufactured 30,000 c.ft. of 400 B.Th.U. gas per ton of coal handled; and this means 12 million B.Th.U. put into the holders per ton of coal. The average of the inerts was under 12 p.ct.; the average naphthalene, 1·2 grains per 100 c.ft.; and the average sulphur, 7 grains. The sale of coke was a little over 6 cwt. per ton of coal carbonized. Mr. Hislop assures all interested that in every direction of use the gas gave complete satisfaction to consumers. What he did not tell his hearers was the price, or rather prices, at which he supplies this gas. But that the charges were relatively low may be taken for granted, when the "Statistical Report" published by the North British Association of Gas Managers informs us that, during the year ending May 15 last, the ordinary consumers were charged 2s., the slot consumers 2s. 7d., motive power users 1s. 8d., and public lighting 1s. 3d. The Bothwell and Uddingston Gas Company's customers are to be envied; for these prices speak volumes.

What does this liberation in gaseous form of 12 million B.Th.U. per ton mean? In the first place, it means that some 40 p.ct. of the original heat value of the coal has been transferred to the gas, to say nothing of the coke and tar, and the other products. In thermal value it also means that the equivalent of 3508 electrical units [3420 B.Th.U.] are put into the gasholder per ton of coal, as compared with an average generation, taking the country through, of 500 electrical units per ton of coal, or 1,710,000 B.Th.U. That is to say, the average production of B.Th.U. the electrical way is only 14·25 p.ct. of what Mr. Hislop was accomplishing at Uddingston in March, or 5·6 p.ct. of the original thermal value of the coal, taking the theoretical figure of 30 million B.Th.U. per ton. Even the one or two generating stations that are working under particularly favourable conditions, securing 800 electrical units per ton (2·8 lbs. per unit), are only producing potential heat energy equal to 2,736,000 B.Th.U., or 22·8 p.ct. of what Mr. Hislop did at Uddingston during March, or 9·12 p.ct. of the heat value of the coal. The inerts in this gas being below 12 p.ct., it can be described as good combustible gas. Assuming a price of 2s. per 1000 c.ft., the consumer would be getting about 42 c.ft. for a penny, or close upon 17,000 B.Th.U., which is equal to approximately 5 units of 3420 B.Th.U. per penny. This is not a comfortable outlook for electricity, nor is the testimony of Mr. Hislop.

We shall be curious to see the report of the Gas Investigation Committee of the Institution of Gas Engineers and the University of Leeds on the results of their research into these matters at Uddingston. It will be remembered that Prof. Cobb in his "Edinburgh Review" article upon "Coal Conservation" wrote: "Typical yields—not the most "recent or the best—for steaming in vertical retorts may "be averaged as 20,000 c.ft. of gas [calorific power not "stated], 18 gallons of tar, and 30 lbs. of ammonium sulphate "per ton of coal." When he wrote the words "not the "most recent or the best," he may have had in mind the disclosures that Uddingston is making to the Gas Investigation Committee, and its constructive contribution to the progress of gas production.

### Salaries and Conditions of Technical Officers.

THERE is much activity in the official world just now with the view of ensuring that, in the great rearrangement of the industrial position, the pay and conditions of the officials—particularly the technically qualified ones—shall receive due recognition. The activity is bursting through the ordinary run of affairs at several places; and there is a determination that technical qualification and official responsibility shall (where they have not already done so) obtain their rightful reward under the new economic conditions, and that they, too, as well as labour, shall have a voice in all that is done, under Government protection and encouragement—as in connection with the National Industrial Council—in the reorganization of industrial relations. The

officials of the gas industry have known for long that there were large patches on their particular map where remuneration and conditions were of an order out of all character with qualification, responsibility, and changed circumstances, and in some cases with no superiority to the wages being paid to the industry's craftsmen and semi-skilled workers (and we were almost adding labourers). This condition of things affects the status of the gas profession as a whole. But the gas profession has been one of the last among its contemporaries to move, and now is not doing so with the vigour and unanimity that are desirable if action is to be effective—this probably being due to a mistaken feeling on the part of those comfortably circumstanced that this is a matter that is no concern of theirs. It is, if they will only look at it from the point of view of the profession collectively, and of the necessity, in the interests of the industry generally, for ensuring that in all parts there is attraction, according to the degree of responsibility, for the best of ability and character. Many of the undertakings that are now ill-paying their executive officials should be the stepping-stones for men who eventually, through merit, might be expected to reach the front professional lines. But those concerns offer no inducement to intellect and capacity.

Electrical men have been moving in these and kindred matters through the Electrical Power Engineers' Association; there is a Society of Technical Engineers, with objects of cognate order; and there is a National Association of Local Government Officers, the Secretary of which (Mr. L. Hill) has sent a letter for publication in our Correspondence columns this week. We are not quite sure that the last two organizations quite fit in with the special conditions of gas officials. Evidently the Electrical Power Engineers' Association does not think them altogether suitable for electrical engineers; for its membership is a considerable one, including (if we are rightly informed) many not only in company but in local authority service. In an industry subject to special conditions, and under both municipal and company administration, there is more in common between the officials of the two classes of undertakings than there is between the officials of different municipal departments. Besides, it is very desirable that technical men of an industry should by united action (whatever the character of ownership of the concerns) support each other by working together. In dealing with labour questions, no distinction has been made between municipal and company gas concerns; and the Committee of Gas Employers embraces both classes of administration, and so does the Joint Industrial Council for the Gas Industry. At the same time, the National Association of Local Government Officers (which, Mr. Hill tells us, includes in its membership administrative, technical, and clerical staffs of gas departments of local authorities) is, his letter shows, engaged on excellent work, which has already secured war bonuses, and is now directed among other things to obtaining for all Local Government officers an adequate increase of salary to meet the reduced value of incomes arising from present economic conditions. The existence of this organization must, of course, be considered in association with any movement for an *ad hoc* association for the technical staffs of gas undertakings.

One of the objects that months ago the Electrical Power Engineers' Association had in view was to ensure that electrical technical men who occupy responsible intermediate positions between administration and labour should have proper representation on the Whitley Industrial Council for the electrical industry; and from Mr. Hill's letter, it is seen that the matter forms part of the programme of his Association. But a very effective step towards representation of officials in all these new creations for the peaceful working of the whole industrial machine was made by the Society of Technical Engineers when Mr. Norman Wyld, the General Secretary, at the last National Industrial Council Conference, moved—"That it be an instruction to the "National Industrial Council to take into consideration the "position of unions composed exclusively of members of "the technical, management, and administrative grades, "and to determine how such unions shall be represented "on Joint Industrial Councils, including the National Indus-"trial Council." No decision upon the motion was at the time arrived at; but it was referred to the Joint Committee of the Conference. The Society of Technical Engineers is, we understand from Mr. Wyld, already in touch with a number of kindred organizations in industry and the professions, with the view to taking common action. But at the moment, there is not a single one of the organizations in the gas industry that can effectually, in view of restricted constitution or power, represent or take up this matter on behalf of gas officials generally. Commenting upon Mr. Wyld's resolution, as quoted above, the "Labour Correspon-"dent" of the "Daily Telegraph" refers to it as "the first "outward and visible expression of a new movement on the "part of workers by hand and brain whose technical and "scientific attainments are essential to the progress and "prosperity of most of our British industries." He is both firm and frank in his recognition that the technical worker and manager should receive a just reward consonant with current economic conditions. To quote him again: "Too "often have they seen the value of improvements, the "product of their trained skill and science, absorbed by "wages advance given to semi-skilled and unskilled workers, "whose whole responsibility consists in the feeding and "watching of the operation of automatic machines." It is for the technical officials of the gas industry to decide as to whether they intend to take their share in these movements, or remain passive as of old; and whether they are going to assert their position, obtain adequate recognition of their profession, and do as much as possible to ensure that in all those places where there is ill-quittance of service amendment shall be made. The dignity and power of a profession cannot be maintained by the few fortunate ones at the top.

## Industry and the Transport Ministry—Position of Electricity.

The proceedings of Standing Committee B of the House of Commons on the Ways and Communications Bill have divulged much that is enlightening; but chief among the points is a keen desire on the part of several interests to be kept outside the ubiquitous scope of the Department. Sir Eric Geddes does not like the look of things. He told the Committee, as amendment after amendment was introduced, that there seemed to be a feeling that the attitude of the new Ministry would be one of extreme malevolence to industry, and to any other interest concerned in the development of transport; also that it was a disgrace to be brought within the purview of the Ministry. For the Minister-Designate of the department to be persuaded that there is a feeling of mistrust abroad is neither inspiring nor encouraging. But if Sir Eric will take a wider sweep in making survey, he will see that this widespread influential attack that is being made on the octopus-like department of which he is the selected head, is not due to any feeling of the Ministry's malevolence to industry, nor to mistrust as to the capacity of Sir Eric himself, but to two more general causes. The one is that the Government is here attempting to bring too much under one roof, and the other that what is now proposed is simply the opening of the door to extensive nationalization, in relation to which, if adopted as a policy, the Government will find itself in the uncomfortable position of being in direct opposition to a very large majority of the leaders of industry, however much they may please certain trade unions. There has been no determination yet as to nationalization becoming part of the policy of the Government. But there have been portents; and the Ministry of Ways and Communications is a simplification of the route to that end. "Ways and Com-"munications" has a larger signification than the original intention.

One of the industries that finds association with the new Ministry in excess of its desires is the electrical. For the moment there has been a severance, due to fortuitous circumstance, and not to any relinquishing on the part of the Government of their view that electricity is an integral part of their Ways and Communications scheme. The "fortui-"tous circumstance" is the illness of Sir Albert Stanley, which has occasioned some delay in the introduction of the Board of Trade Electric Power Bill, under which the whole subject of electricity is to be dealt with. But when the Home Secretary states that the Government is as convinced as ever that it is essential the control of electricity should be in the hands of the new Department, the industry will find small gratification in the acceptance by the Government of an amendment to the Ways and Communications Bill deleting from it the provision relating to the transfer of the powers referring to electricity supply. The omission to which the Government has consented will probably now be incorporated in the Board of Trade Bill; so that every phase of the scheme and decision as to the controlling department can be dealt with under one measure. Anyway,

the unaltered Government view does not relieve the electricity industry of any of the nebulosity with which its position in relation to future internal development has of late been obscured; and the deferring until after Easter of the consideration by Parliament of the scheme in which it is mainly concerned only prolongs the obscuration. For the industry things are, if the report of the Committee of Chairmen of the Ministry of Reconstruction [*ante*, p. 75] stands for anything, undergoing a vast change. Should their ideas be adopted, the electricity supply industry will lapse from the heights of generation into mere distributors and salesmen. There will in time be no control by it over generation. It will compulsorily have to purchase in bulk from distinct electricity producers and vendors. If this is the decision of Parliament, then it cannot matter much to electricity undertakings whether their industrial business represents 80 p.ct. and transport only 20 p.ct., or as to what department is to be the supreme authority. All with which the local distributors and salesmen will be concerned will be the buying of electrical energy at a price that will enable them to sell below the charges that would otherwise obtain under present conditions. Under any national scheme with higher expenses for distribution, will the big cities and towns be able to do this? Dubiety refuses a categorical reply.

## The National Industrial Council.

Employing as it does an army of men, and with a representative—Mr. D. Milne Watson, the President of the National Gas Council—upon the Committee appointed to frame a policy and course of procedure for the National Industrial Council, the gas industry is naturally concerned in the developments of the scheme. A further cause for interest is that, both immediately and indirectly, its own fortunes are affected in some degree by any intermittent disturbances in the industrial system, no matter the quarter. Thus it is that anything that will help to maintain, if it cannot guarantee against occasional breaches of, industrial peace, is of importance to the industry, must be welcomed by it, and must have claim to its good wishes. The Committee's recommendations—be it remembered they are the joint product of the representatives of employers and of trade unions—have now been before the country a sufficient time for them to be thoroughly digested. The report has been applauded, has been designated a new industrial charter, and there has been no end to the generosity of the encomiums passed upon it. The proposals are to be embodied in a Bill which will be introduced very shortly in Parliament. The new National Industrial Council will partake of the nature of an Industrial Parliament, which will consider any difficulties that may arise between employers and employed, and will act as an advisory body to the Government in connection with matters affecting industrial legislation. There is no question that the war has given us a great democratic leavening, has thrown fresh light upon the relative conditions of the constituents of the body politic, and has infused a new spirit among the people. This movement is one result. But we cannot get away from the fact that much of the change here mentioned would not have occurred, or rather would not have reached the present extent of influence, had it not been for the force exerted by the general unrest among workers.

The report of the National Industrial Council Committee is an instrument marking a new state of things. It reveals a desire on the part of both employers and employed to unitedly deal with industrial conditions in a statesmanlike way, and not to leave them to the haphazard methods and individual views (often moulded by utter selfishness) that have obtained all too frequently in the past. We can see an immense amount of valuable work that the Council can at once do; but while it is hoped that it will mitigate trouble by suppressing wrong and maintaining right, we cannot expect that it will create a perfect state of bliss between employers and employed. Employment is not a matter that is subject to only the wills of employers and employed. Many other and more material factors enter; and, while rules may be made as to maximum hours and minimum wages, employers cannot guarantee that men will be required for the maximum time, or that the hours they work will entitle them to anything more than a proportion of the minimum wages. Nor can anything the National Industrial Council may do deprive a man, or any number of men, of their liberty to leave work within the conditions on which they enter the service. The Committee fully recognize that there may be not only unemployment but under-employment, and recommend an extension of unemployment insurance to under-employment. Just now the country is having a bitter experience of a preference on certain terms (even if not so high as a minimum wage existing in a trade) for unemployment, which is not all due to employers, but to a reluctance to work—not in all cases, but in not a few—so long as a benevolent country will contribute to idleness. Many men, many minds; and it is this fact that will yield the grit that must inevitably impede the constant smooth running of the national industrial machine.

There are mixed views as to the question of a minimum wage. Every man should be in a position to earn a sufficient sum to enable him and those dependent upon him to live a wholesome life. But there are men and men. And the minimum wage will be an inducement to dishonest men to be satisfied with it, and to give as little in return for it as possible. Men of industry, ability, initiative, and capacity are not, under such a plan, given their full head; and there is thus danger of insufficient encouragement of personal qualities. The Committee also recommend fixed standard hours and conditions of service in every industry and trade. Leisure is an essential in the working life; but fixed conditions of the kind in some industries will prevent men disposing of their labour as they think best, and as physical capacity will permit. Nevertheless, our economic position has changed enormously; and what is required in the interests of the whole country and its people is the very best energy from all men in promoting production. However, if the National Industrial Council does all that is expected of it, it will contribute largely to what every intelligent man desires—that is, industrial peace, which will enable a strong and united effort, though under new conditions, being made to bring the Old Country round again to a high state of prosperity, and to maintain it there, so far as external conditions will allow.

## Private Test Results for the Gas Investigation Committee.

In the present condition of technical affairs in the gas industry, there must have been a large amount of research proceeding in private laboratories, in gas-works, and in the establishments of gas-appliance manufacturers, which have a bearing upon the question of the relative efficiencies of various grades of gas in different appliances. The Research Sub-Committee of the Gas Investigation Committee are anxious to obtain the results of such private experiments and inquiries for examination and comparison with their own. If anyone sending such results will say to what degree he desires privacy (if any) to be observed, his wishes will be respected. Wherever possible, however, results should be placed unreservedly at the disposal of the Sub-Committee, with information of the kind indicated at the end of the communication that appears from Prof. J. W. Cobb on a later page. It is also desired to subject to scientific examination appliances for which increased efficiencies are claimed, in order to ascertain the causes of the higher efficiency. It is up to everyone who can do so to send to Prof. Cobb, at the Leeds University, any results of work of the character suggested which may be of service to the industry.

## House Connections.

With all the promise that has been held out to them of having big super-power stations, a network of cables conveying electricity to all parts of the country, and Government financial and other aid, as well as the glory of saving the country millions of tons of coal a year and a fabulous amount of money (directly through the electricity industry's own operations, and indirectly through the industrial development to which it will give the enabling power), electrical men are not pleased. They object to the delay there has been in granting the wherewithal for the pro vision of house connections. This is revealed by correspondence which Mr. H. Faraday Proctor, the Hon. Secretary of the Incorporated Municipal Electrical Association, has had with the Local Government Board. He asked them for relief in the matter of sanction to expend capital for the purpose; and, in order to soften the heart of the Board, he told them that suppliers of gas had been busy making new connections while electrical undertakings had had to look on. This is interesting, and must be largely a matter of imagination. Gas suppliers could not get fresh money any more than could electricity suppliers for making new connections; and with the sickly-looking dividends now being paid through the operation of the sliding-scale of price and dividend

maximum prices, and the Statutory Undertakings (Temporary Increase of Charges) Act, no one wants to invest in new gas issues unless carrying much higher rates of interest than before the war. Far from gas being favoured, it is being very hardly dealt by. However, the Local Government Board no doubt appreciated all this when Mr. Faraday Proctor told them what gas suppliers were supposed to be doing. However, the upshot of the correspondence is that, the Treasury having relaxed their restrictions as to the issue of capital for home use, the Local Government Board have now no hesitation in benevolently authorizing the raising of loans for electric mains, services, transformers, and meters, both for industrial and domestic purposes.

### Crude Benzol and Motor Cars.

It is to be hoped that gas undertakings will not be guilty of the folly of selling crude benzol to any obtuse motor car owners (if there be any such), for it is sure, owing to the impurities it contains, to lead to engine trouble. A correspondent has written to the "Motor" stating that his local gas company have no rectified benzol for sale, but they can supply the crude. He asks whether he might try it, and is told that his engine cylinders would need cleaning sooner than otherwise, as carbon would tend to form more quickly. There are other constituents which it is as well should be kept below certain levels; and rather than "queer the pitch" by selling crude benzol, gas undertakings had better be without the business. Those gas-works that have not the means for rectifying benzol should either supply the deficiency, send the product to a distiller, or enter into a co-operative rectification scheme. The business is too good to play fast and loose with it; and it will be wiser only to sell for motor purposes on the standard specification of the National Benzol Association, as published on Feb. 18 [p. 322], or as some critics think tightened-up a little ["Journal," March 11, p. 511] as to sulphur impurities—carbon bisulphide and thiophene. Nearly every week, there are car owners who bear testimony in the motor papers to a greater mileage per gallon on benzol than on petrol.

### The Voice of the Miners.

The miners have done the prudent thing. They have in the ballot taken on the question of accepting or rejecting the Government terms, as formulated by the report of Mr. Justice Sankey and three of his colleagues on the Coal Commission, voted heavily in favour of acceptance. Yorkshire is the only field of importance from which returns have not been announced at the time of going to press; but it is said the majority there in favour is overwhelming. The fields from which returns have been made are: South Wales, Lancashire and Cheshire, Northumberland, North Staffordshire, Lanarkshire, Derbyshire, Durham, Nottinghamshire, Leicestershire, North Wales, and Stirlingshire. The aggregate of the votes from these areas cast in favour of acceptance is 464,639, and against only 54,043—the majority thus being 410,596. We trust that this means a long term of peace now in the coalfields, though there is little hope of coal prices at the pithead being substantially reduced for at any rate some considerable period.

### The Gas Light and Coke Company Reduce their Price.

The Directors of the Gas Light and Coke Company announce that, in consequence of a lowering of the price of oil used in the manufacture of gas and also in the cost of freights of coal, they are enabled to reduce the price of gas throughout the whole of the Company's area of supply from 4s. 4d. to 4s. 2d. per 1000 c.ft., as from the readings of the meter indices for the March quarter.

**Eastern Counties Gas Managers' Association.**—The full programme has now been issued by the Hon. Secretary and Treasurer (Mr. F. M. Paternoster) of the meeting of the Association which is to be held on Thursday, May 1, at the Angel Hotel, Bury St. Edmunds, under the presidency of Mr. H. R. Wimhurst. At one o'clock the members and guests will be entertained at luncheon by the Chairman and Directors of the Bury St. Edmunds Gas Company. At the meeting, which will be held at 2.30, the President will deliver his address, and Mr. W. W. Townsend will read a paper entitled "Water-Gas Plant at Colchester." Here will also be considered an addition to the rules providing for the election as an honorary member of "any gentleman who, by his services to the Association or to the gas industry generally, has merited such an honour." In the evening the annual dinner will be held at the Suffolk Hotel.

## PERSONAL.

It is gratifying to learn that Mr. J. Herbert Canning, F.C.S., has been appointed to succeed his father, the late Alderman Thomas Canning, as Engineer and Manager of the Newport (Mon.) Gas Company. The commercial management will continue, as previously, with Mr. T. H. Hazell, the Secretary. Mr. Canning, who was educated at Cardiff, Bath, and the Newport Technical Institute, is a silver and gold medallist in Science of the Newport Technical Institute, and a silver medallist in honours of the City and Guilds of London Institute examination in Gas Manufacture. He was articled to his father in 1891, and subsequently was appointed his Assistant. He became Resident Engineer of the Crindau Gas-Works in 1901; and twelve years later, when Alderman Canning became a Director of the Newport Gas Company, Mr. Herbert Canning was appointed Manager of the Company's works. He was President of the Wales and Monmouthshire District Institution of Gas Engineers and Managers in 1910-11, and in 1917 was elected a member of the Council of the Institution of Gas Engineers.

The Bradford City Council, last Tuesday, approved recommendations by the War Wages Committee of increases of the salaries of several municipal officials. The increases include those to the Gas Engineer and Manager, Mr. Charles Wood, from £1000 to £1250 per annum, and to the Deputy Gas Engineer, Mr. E. J. Sutcliffe, of £50, bringing his salary to £578.

With reference to the announcement in last week's issue of Mr. H. W. Saville's appointment to Wexford, it may be added that the vacancy there arose through Mr. J. J. M'Evoy (who was formally appointed to the position towards the end of last year) being prevailed upon to remain in the position he then occupied as Manager to the Midleton (co. Cork) Gas Company.

Mr. Frank S. Townend, B.Sc. (Eng.), who for the last four years has been a member of the engineering staff at the Nechells works of the Birmingham Corporation Gas Department, has resigned in order to join the staff of the Leeds University and assist, under the direction of Dr. A. Parker, in the carrying out of large-scale tests of gas production efficiency for the Institution of Gas Engineers. He has been with the Birmingham Gas Department since 1911, and has had an extensive experience in retort-house and other work. While with the department, he has succeeded in obtaining the Engineering Degree of the London University; and he also holds first-class certificates in both Gas Engineering and Gas Supply. Some three months ago, Mr. Townend read a much appreciated paper before the Midland Junior Gas Association, on "Centrifugal Fans and their Application to Gas Engineering Practice."

Previous to his leaving to take up the position of Secretary of the Town of Dudley Gas Light Company, Mr. George E. Ashurst, the Chief Commercial Assistant in the Gas and Water Department of the Wallasey Corporation, was presented with a gold watch by the officials and his fellow workers. Mr. J. H. Crowther, the Gas and Water Engineer, said that, while they were all sorry to lose Mr. Ashurst, they were pleased that he was only leaving to take up a better position, and one with wider prospects than the Wallasey Corporation could offer him. In making the presentation, Mr. W. S. Chantrell (the Chairman of the Gas and Water Committee) remarked that Mr. Ashurst had been twenty years with the Corporation; and he wished him every success in his new sphere. Mr. Ashurst said he would always treasure the watch, which would remind him of his happy times and many friends in Wallasey.

An interesting function took place on Friday last in the Glasgow City Chambers, when the Gas Committee of the Glasgow Corporation presented Mr. Ralph Halkett, the Assistant General Manager of the Gas Department, with a solid silver rose bowl, suitably inscribed, as a parting gift on his leaving Glasgow shortly to take up the position of General Manager of the Sheffield Gas Company. Bailie Drummond, in the course of his remarks, said that it was with regret they were losing the services of their Assistant General Manager; but through it all he was pleased to think Mr. Halkett was going to fill so important a position in the gas industry. For the past six and a half years Mr. Halkett had been with the Gas Department, and of late he (Bailie Drummond) had been personally in touch with him; and it was only right to say that his services had been of the best, and his experience of great benefit to the department. He was just the type of man to hold a public appointment—straight in every sense of the word. He also commented on the rapid strides the undertaking had made since Mr. Halkett came, and trusted that greater prospects were still in store for the department. In the name of the subscribers he then handed over the silver rose bowl, wishing Mr. Halkett every success and happiness in his new sphere of life. As a personal gift, he asked Mr. Halkett to accept a gold pencil case. Bailie Paxton, in a few words, mentioned that he was responsible for bringing Mr. Halkett to Glasgow. After interviewing all the other candidates at their posts, he was perfectly sure at the time that he had made a wise choice, which had since been proved through the valuable services rendered to the Department by Mr. Halkett. Mr. Halkett, in reply, said a great honour had been done him that day, and he much appreciated the gift. No amount of eloquence could tell how he felt over their kind and generous gift. These years in Glasgow would never be forgotten, and with the gift before him the memory would be a vivid one. It

had always been a great pleasure for him to work for and with them, and he felt the parting very keenly. He would just like to add Mrs. Halkett's thanks to his own.

Mr. H. F. M'Nair, the Gas Manager at Kirkcudbright, has been appointed Manager of the gas-works belonging to the Tayport Town Council.

Major Frank W. Richmond (of the Richmond Gas Stove and Meter Company) was married on Saturday, the 5th inst., at St. Martins-in-the-Fields Church, Trafalgar Square, London; the reception afterwards being held at the Hotel Russell.

Sir Adam Nimmo, K.B.E., has tendered to the President of the Board of Trade his resignation of the assistant position he has held for some months in connection with the Coal Controller's Department.

Prior to his taking up office as Manager of Dungarvan Gas-Works, Mr. W. P. Lonergan, the late Manager of the Lismore Gas-Works, was the recipient of a presentation from his friends in the latter town and district.

Mr. Thorpe Foster, the Manager of the Low Moor Company's coke-oven plant, near Bradford, was one of the recipients of medals of the Order of the British Empire, presented at Leeds recently by the Earl of Harewood (Lord-Lieutenant of the West Riding) on behalf of the King, as awards for gallantry in connection with various munition works explosions. Mr. Foster, it may be remembered, displayed the greatest bravery in securing the safety of his plant and the continuance of operations at a time when the bye-products were greatly needed for war purposes, during a disastrous explosion at a neighbouring munition works. Mr. Foster is a member of the Coke-Oven Managers' Association, Midland Section.

Mr. Robert Gibson, Head Foreman of the Glasgow Corporation Gas-Meter Department, has been presented with a gold watch, pipe, and tobacco pouch by the employees, on the occasion of his leaving the service to take up a similar post with Messrs. Peebles and Co., Meter Makers, Edinburgh. Mr. Gibson has been only a year with the Corporation; but he has endeared himself to the employees by his upright and manly dealing with those under him, and the best wishes of all go with him to Edinburgh. Mr. Gibson is an old Volunteer and Territorial. He was mobilized at the start of the war, and went to France as Staff Sergeant Fitter with the 1st Lowland R.F.A., Midlothian Battery.

Mr. Percy J. Kendall, son of Mr. J. Kendall, the Resident Superintendent of the Great Yarmouth Water-Works Company (recently discharged from the Army owing to wounds), has been appointed Assistant to Mr. W. S. Venner, the Engineer and Manager of the Brentwood Gas Company. Mr. Kendall received his early training under Mr. J. Witten, late Engineer and Manager of the Gorleston and Southtown Gas Company. Upon leaving Gorleston he was engaged with the Barnet District Gas and Water Company, with whom he remained until the outbreak of war.

## OBITUARY.

### JOHN B. SCOTT, of Cowdenbeath.

There passed away at a nursing home in Edinburgh last Thursday Mr. J. B. Scott, the Engineer and Manager of the Cowdenbeath Gas Company, Ltd. About twelve months ago, he was assailed by a very serious illness, when he was granted three months' leave of absence from his duties, returning at the end of the period very much benefited in health. Unfortunately, however, about two months ago he had a recurrence of the trouble from which he had been previously suffering, and which has carried him off at the early age of 47 years.

Mr. Scott became connected with the Cowdenbeath Gas Company at a time when the concern had passed through a period of great vicissitude, and when the undertaking was practically under a cloud; but under his able management, it gradually extended its borders, until it embraced the neighbouring populous districts of Crossgates and Aberdour. Taking a very deep interest in all affairs pertaining to the gas industry, he was President of the Informal Meeting of Scottish Gas Managers several years ago; and in 1915 he was President of the North British Association of Gas Managers, when the meeting was held in Edinburgh. A man of shrewd sense and sound practical knowledge, his views on all questions affecting gas management and manufacture received careful consideration by his brother managers. He had made a special study of the valuation of Scottish gas undertakings for rating assessments, and had appeared on several occasions as an expert witness; while he had also to do with the laying-out, construction, and completing of several new gas-works—among them those at Cardenden, Kennoway, and Largo. He also undertook a great deal of reconstruction work.

Mr. Scott was connected with a family closely associated with gas-works management. His brother (now deceased) was Manager at Blantyre; while he has two sons in the industry. The eldest is Manager to the Kennoway and Largo undertakings; and his second son is Manager of the gas-works of the Newtownards Urban District Council. His nephew is now Manager at the Blantyre Gas-Works. One of his sons, who had been previous to the war in the Cowdenbeath works, under his father, only recently arrived home, after having been for some time a prisoner of war in Germany.

The deceased was buried on Saturday in Morningside Cemetery, Edinburgh.

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Mr. A. J. Walter, K.C., who had made a great name for himself in connection with the conduct in the Courts of patent cases, met with a terrible death last Wednesday evening, being killed on the Underground Railway. In addition to his work at the Bar, he was devoted to chemistry and electricity, and is said to have made many valuable experiments in his private laboratory. He was called to the Bar in 1885.

## ELECTRICITY SUPPLY MEMORANDA.

The name of Mr. Ed. C. de Segundo at the head of an article in the "Electrical Review" reminds that some months ago comment was made in these columns on a contribution from his pen to the same contemporary. The present article is on "Fuel Economy from the Householders' Point of View;" and it has been perused to ascertain the further experiences of our friend, who, being an expert in these matters, is not in this particular connection an ordinary householder. The fresh article adds nothing of weight to the discussion as between the relative values of gas and electricity for heating purposes; but it does show that Mr. de Segundo, in his own house—by evicting a large gas-cooker (which may have been too large for his purpose for aught we know) and certain gas-fires, and by installing in their place three 20-in. high and one 25-in. high "Magnet" stoves burning anthracite and coke, one 6-ampere electric hot-plate (which was, no doubt for very good reasons, used very seldom), and two two-bar and one three-bar "Arora" electric-heaters (rated at 750 watts per bar)—effected an economy of £8 during the last quarter of 1918 compared with the corresponding quarter of 1917. Most people prefer radiant heat and not convected heat for warming their rooms; but, judging from his use of anthracite and coke stoves, Mr. de Segundo has no particular choice. As to the electric-heaters, during the quarter 261 units were used, which would only be equal to a full running of the heaters for fifty hours out of the 2184 hours constituting three months—that is to say, seven bars, multiplied by 750 watts, equal 5¼ units per hour; and 261 units divided by 5¼ would equal fifty hours' constant use. For this electricity for heating, he seems to have paid 1·2d. per unit, which is modest for the last quarter of 1918. We can well appreciate Mr. de Segundo's remark that "my 'Arora' electric-heaters have been most useful for heating rooms occupied for short periods," with emphasis on the "short." The figures show that he was studiously economical in their use; but he adds:

**Householders' Heating Rearrangements.**

> In such circumstances, they certainly possess advantages over the gas-stove, as they are portable, and their range of action can be made as wide as one pleases by a little forethought [by the way, the cost of installing the separate heating circuit and mains and apparatus was £30] in selecting suitable positions for the wall plugs. No doubt, a gas-stove would have been cheaper per 1000 B.Th.U. usefully emitted; but as I was situated, I would rather pay more and have my "Aroras." That, however, is a purely personal matter.

Those who read this will not forget the four stoves in the house burning anthracite and gas coke, which must have contributed largely to the general heating. The article is really an argument for the use of anthracite and coke for general heating, and a reduced use of coal, gas, and electricity.

**In the Kitchen.**

We come to Mr. de Segundo's remarks as to gas-cookers. He points out that, with gas at 500 B.Th.U. per cubic foot, 6·82 c.ft. should liberate the same quantity of heat as an electrical unit. "Thus electricity should cost 0·2d. per unit in order to be on a par, as regards cash value, with 500 B.Th.U. gas at 2s. 6d. per 1000 c.ft." He proceeds:

> It is difficult to see how a gas-cooker—with any pretence of avoiding the risk of contamination of the food by the products of combustion—can transmit to the food as high a proportion of the heat liberated as the properly designed electric-cooker. I do not think my gas friends should quarrel with me if I put the relation of the two as $x$ for the electric-cooker to 0·7 $x$ for the gas cooker. In other words, instead of 6·82 c.ft. of gas, you would have to burn 6·82 × 1/0·7, or 9·74 c.ft. of gas to obtain, *in effect*, 3410 useful thermal units.

Suppose it does, 9·74 c.ft. of gas would cost less than ¼d. at 2s. 6d. per 1000 c.ft. But surely Mr. de Segundo knows that relatively the use of the oven is small to the use of the hot-plate for the whole range of cooking operations, especially for heating water for kitchen use, and that the electric hot-plate demonstrates its inefficiency with great effrontery. Probably, too, he has not heard of the inefficiency that was recently shown with an electric cooker in tests in which a maker of such appliances engaged with the British Commercial Gas Association; and of the offer of the

Association to take part in further tests, under the best of auspices the electrical industry can offer, with the same object in view, and embracing all culinary operations in which heat is required. As to the risk of contamination of the food, what are the contaminating products of combustion, and what is the nature of their contamination chemically considered? If Mr. de Segundo has any doubt at all about them, there are makers of gas-heating appliances who have on the market externally heated gas-ovens which show a very high efficiency by the utilization of what in the older types was purely waste heat. Invention and improvement of gas-heated appliances are not standing still; and while the heat usefully employed in gas appliances is already considerably cheaper than that usefully employed in electrically heated appliances, the scope for improvement in the former gives promise for still greater successes.

**Variety of Appliances and Householders' Preferences.**

Mr. de Segundo, however, makes his independence quite clear. He submits that "no very useful purpose can be served by the mere tabulation of *ex parte* statements on the relative merits of gas and electricity. . . . Each has its merits, and can only usefully be considered from that point of view." He also mentions a separate apparatus for hot water supply. Now the mass of the people cannot afford a considerable number of different appliances for the variety of heating purposes obtaining in the household—coal grates, gas-fires, electric-heaters, anthracite and coke stoves, gas or electric oven, and gas or electric hot-plates, and a gas, or coal, or coke water-heating apparatus for providing hot water in bulk. Landlords will not instal all these, and householders' purses will not allow them to do so. Gas can do the whole of the work with few appliances and with greater efficiency and less cost than electricity, and, compared with solid fuel, a saving of household labour, which is very requisite in dwelling-houses in these times when servants are scarce, and in the majority of homes where the contents of the pocket will not allow of them being kept. Mr. de Segundo has been asked for some positive statement upon the relative merits of gas, coal, and electricity, for warming houses. This, he admits, is impossible of achievement, because few householders look at the matter from the same point of view, and the conditions to be fulfilled vary widely in different households. He realizes fully that human beings are not like Kew-certified thermometers, which respond equally to identical thermal conditions, and the knowledge that $x$ thermal units were being let loose in a room per hour will not induce the same state of consciousness in every individual mind. "You cannot," he adds, "make a man feel warm by arithmetic, however simple; and we do not argue with ourselves whether we ought or ought not to feel cold, we only know that we do or do not feel cold." But the fact remains that for the number of heat units "let loose in a room," the gas-fire is cheaper than the electric-heater; and the greater the number of heat units transmitted to the room, whatever may be the physical or psychological conditions of the occupants, the warmer the room must become, and therefore the warmer must the occupants feel than if a source of heat was being used which emitted a less quantity of heat. We sincerely admire the guarded character of Mr. de Segundo's article. It was wise it should be so, because, in confirmation of differences of the human mind, gas undertakings have continually extending records of gas-heated appliances taking the place of electrically heated ones; and for more than one reason.

**Abstractions and Academic Disputations.**

The "Electrical Review" has published an editorial article which makes a complete detour outside the contents of Sir Dugald Clerk's recent Royal Society of Arts paper, and keeps clear of the solid substance within. It does not touch upon actual statements or figures—figures which constitute hard facts and hard nuts. It refers to the unprovoked onslaught made upon the electrical industry. The memory of the "Review" is short. It forgets the provocation that came from reports by Departmental Committees which mislead, by strange hypothetical calculation, as to the part that electricity is assumed to be capable of taking in coal conservation, and as to its wonderful power in providing a thermal efficiency, in which gas is so much its superior, but acknowledgment of which was an omission from the reports in question. Sir Dugald Clerk's paper constitutes a reply—not a full one, but a genuinely frank and open reply; and every item in it invites electricians to say where it is wrong. What is the result so far? Not a single electrician has yet come forward to show Sir Dugald that he has made a mistake or mistakes. Either Sir Dugald is right or he is wrong; if he is wrong, this can be shown by the same process that he adopted. All the electrical journals have made darts at the paper, and then have receded, leaving nothing behind but the most general comment. In the "Review" Sir Dugald and Lord Moulton are accused of not having given heed to realities, and of limiting their mental vision to abstractions. Physical facts, when subjected to measurement, it seems, according to our contemporary, are "abstractions;" and figures that cannot be disproved as to heat efficiencies and economies are "misleading academic disputations." To see things so misnamed in the "Review" must be a matter for considerable regret to the men of the electrical industry.

**Reflections and Work Done.**

But should misnomers not dispose of the matter, the shock of another formidable statement ought to bring us to the ground. "There is," we read, "no need in this case to go away and try experiments—the facts are clamant, obtrusive, inexorable." This looks really terrible. But what are the so-called "facts"? "They are reflected"—only "reflected"—"in the quarterly accounts," which is "the most convincing of all arguments." They are not data as to actual efficiencies from the coal onwards to the use of the product. Now will the "Review" show us cases in domestic lighting where, for an equal amount of light, electricity is cheaper than gas? Will it show us where in electric cooking, with an equal amount of work done in the oven and on the hot-plate, the cost is "about the same"? Will it give us reasons, and follow them up by substantial proof, why it says that cooking is "far better done" with electricity than by gas? This is a matter that it is always interesting to discuss, particularly from the point of view of the retention of nutritious juices in low-temperature cooked meats and the results of analytical investigation—the freedom of escape of the juices from slow and long low-temperature cooking being greater than where rational conditions exist in the contrary direction. It is admitted by the "Review" that the cost of heating is greater with electricity than with gas, but "the benefits are far greater." What are these benefits? Are they "reflected" in the number of electric heaters in use compared with gas-fires? "The reason is," so our electrical contemporary says, "the work is done by electricity far more efficiently than with gas—much less electricity is used than paper calculations indicate." But the B.Th.U. can only do a certain amount of work, and no more; and a definite amount of thermal energy must be expended to do a given amount of work in heating. As to power, gas-engines and gas-furnaces were also among the factors—and the gas industry can present still more "factors"—in winning the war. On the point of thermal efficiency in relation to power and the other questions, was Sir Dugald Clerk right, or was he wrong? Every instance in which power is required must be judged on its conditions; for long-hour running where a number of machines can be operated from a single engine, gas defies electricity on the basis of economy. Our contemporary seems to have overlooked water heating in its catalogue of work in which electricity can, according to its dream, operate more efficiently than gas, and reflect a convincing argument in the quarterly accounts.

**A Fundamental Weakness.**

We now come to a very strong admission, It is fundamental to the whole matter; but electricians, as a rule, try to hide the deficiency by giving it as little public recognition as possible. The "Review" says: "The weak point of the electrical case is the waste of bye-products, including heat . . . and here is the point at which the electrical and gas interests should collaborate." Waste of heat should come into the discussion before waste of bye-products. It is in the last two stages of the conversion from coal to electricity that the greatest loss occurs. The gas industry may co-operate with the electricity industry; it may save valuable products from coal by its carbonization; it may supply coke, gas, or waste heat for the generation of steam; it may get a boiler efficiency of 80 p.ct. or so (by surface combustion nearly 95 p.ct. of the heat value of the gas might be the efficiency), but then there is the step-down in the turbine, and the further step-down in the generation of the electricity, and there are besides the losses in transmission and in the reconversion to heat. There are losses that no amount of collaboration can save; they are inherent to, and inseparable from, the electricity generating system. These are the hard facts; and in the cause of national efficiency, so far as heating purposes go, the gas had far better be used direct (unless producer gas only be employed for boiler heating), and such heavy losses as electricity involves be avoided. The gas industry can preserve for the nation the great losses of products now incurred by the carbonization of bituminous coal under steam-boilers. This is where prohibition should come in. There are other coals of a less valuable order; and there is gas coke, and there is producer gas. To employ bituminous coal for the raising of steam is a prodigal use of the nation's resources and power.

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**Sir Guy Calthrop's Will.**—Probate has been granted of the will of Sir Calthrop Guy Spencer Calthrop, Bart., the late Coal Controller, who died on Feb. 23. He left £15,300, with net personalty £12,936.

**Dyestuffs Import Control.**—The Trade and Licensing Committee appointed by the Board of Trade to administer the Prohibition of Import Proclamation relating to the Import of Dyestuffs, give notice that, as from the 14th inst., the general licence which was given by them on Feb. 27 in respect of the import of products covered by the proclamation, but which are of *bonâ-fide* American, French, or Swiss origin, will be revoked. All consignments, however, which can be shown to the satisfaction of the Customs authorities to have been *en route* from the place of origin in any of the countries mentioned to the United Kingdom on a through bill of lading on April 9, will be admitted without special licence. In all other cases a permit must be obtained from the Trade and Licensing Sub-Committee before the purchase abroad of dyestuffs or any other products covered by the proclamation.

## COAL TAR AND SOME OF ITS PRODUCTS.*

The name of Mr. A. R. Warnes is well known to members of the gas industry as the author of the serviceable text-book on "Coal-Tar Distillation." Those who have read the volume will be assured that Sir Isaac Pitman & Sons, Ltd., secured a good and competent writer for the book on "Coal Tar and Some of its Products" which has recently been added to the "Common Commodities and Industries" series issued by them.

Allusion has already been made in the "Journal" to this handy set of books intended for the general information of the reading public. Mr. Warnes has succeeded in giving a popular description of a technical, and to some extent difficult, subject. The "Introduction," of thirteen pages, traversing the history and growth of the tar industry, and incidentally furnishing a concise account of W. H. Perkins' investigations and dye discoveries, would make an interesting and informative newspaper article, and possibly provide the publishers with a good advertisement of the usefulness of the series. The closing paragraphs of the introduction suggest not merely the importance of the tar colour industry, but the necessity of greater scientific assistance in its development. Mr. Warnes says that there is undoubtedly a considerable amount of material yet remaining in coal tar which is not utilized; and since Great Britain distils more than one-half of the tar produced in Europe, science and commerce should help in its investigation to secure a great future in this direction. Sir Robert Hadfield recently pointed out that in the year 1913 the annual value of dye-stuffs used in this country amounted to £2,000,000, supplied to trades with a capital of £200,000,000, and employing 1½ million workpeople. Yet only one-tenth of the required dye-stuffs was produced at home. Happily, all this is being altered; and Mr. Warnes' remarks should help to educate public opinion in furthering the change, both as to this and other phases of tar distillation products.

The author in the first two chapters gives a good general description of the production of tar as a residual in the manufacture of coal gas and oven coke, and also of the chief primary products obtained in its distillation, with some reference to their uses for road treatment, roofing felt, timber preservation, and the like. The plant needed for intermittent and continuous distillation, and the processes involved, are clearly outlined and illustrated.

The production of tar in the United Kingdom is estimated at 160,000,000 gallons per annum. This is surely understated, since the coal used for gas and oven coke manufacture is somewhere in the neighbourhood of 35 to 40 million tons. Mr. Warnes then proceeds to discuss successively pitch, creosote oil, naphthalene, and anthracene oil, and their respective uses. It is interesting to note that the consumption of creosote oil is both considerable and increasing. That used by the United States of America in 1916 was nearly 89 million gallons, and of this 41½ millions was imported from England. Its utility and continued value are indicated by its high thermal value—16,630 B.Th.U. per lb.

There is a chapter on ammoniacal liquor (although the quantity produced from tar distillation is comparatively small) and the resultant ammonia products; and the description and illustrations of sulphate of ammonia manufacture should give the uninitiated a good idea of the process. Allusion is made to the "bad egg" odour of ammoniacal liquor; but no mention is made of the offending gas, or the fact that it is removed with the waste gases during treatment. Useful information is afforded of the several uses to which ammonia compounds are put, some of which will probably be unknown to the public.

The following chapters are devoted successively to the working-up of crude naphtha and light oil; the chemical treatment of the "once-run" benzol, naphtha, and heavy naphtha; the manufacture of benzols and naphthas—then to commercially pure benzene and toluene and their uses; and to the manufacture of pyridine bases, and carbolic and cresylic acids, with their application to public requirements.

No reference need be made to the author's descriptions of the plants employed or to the processes involved in manufacture. These are on the lines of Mr. Warnes' work in his more technical book, but simplified as far as possible for the ordinary reader. Probably, however, the latter will be more interested in the brief accounts given in each chapter as to the nature of the products themselves and the numerous and distinctly varied purposes they serve in the every-day life of the nation. The extent and ramifications of ultimate distillation and treatment must come as a surprise to many who only know vaguely that coal-tar products are used in a number of industries and find their way into spheres of drugs, perfumes, and flavourings. The "family tree" diagrams of benzene and phenol derivatives are both interesting and useful. Incidentally, it may be remarked that the numerous results of the varied treatment of the important raw material, benzene, in Chapter VIII., is particularly well outlined.

It is possible that this book, intended for the purely non-technical reader, may be found from his standpoint a little difficult, since the nomenclature of distillation products is not that of everyday language. This, of course, is unavoidable; but some help would perhaps have been afforded if the author had included a short glossary of the chief distillates and residues, describing at least their physical characteristics, much as was done in the text when referring to the primary products. Reference to such a list would prepare the reader, and enable him to some extent to realize the nature of the substances dealt with.

We trust Mr. Warnes' book may serve a useful purpose in interesting those of the public who desire general knowledge of the country's industries. Gas students who have not as yet had occasion, but desire to acquaint themselves with the subject, would indeed do well to start with the volume.

* "Coal Tar and Some of its Products." By Arthur R. Warnes, F.C.S., A.Inst.Mech.E., Lecturer on Coal Tar Distillation at the Hull Technical College. London: Sir Isaac Pitman & Sons, Ltd. [Price 2s. 6d. net.]

## DRYING OF SULPHATE OF AMMONIA.

At last week's meeting of the London Section of the Society of Chemical Industry, Mr. Eustace A. Alliott, B.Sc., read a long paper (accompanied by a number of lantern slides) on "Drying by Heat in Conjunction with Mechanical Agitation and Spreading;" and in the course of the subsequent discussion, Mr. P. Parrish, of the South Metropolitan Gas Company, made some remarks on the drying of sulphate of ammonia.

Mr. Parrish said that none of the apparatus which the author had described would deal with the huge quantities of superphosphates that were required as artificial manure; and as regarded the sulphate of ammonia industry, the plants that had been referred to were too mechanical altogether. Two essential considerations had to be taken into account in this connection. The first was that, after the sulphate of ammonia left the centrifuge, it had to be stored. The sulphate of ammonia trade was a seasonal one; the demand in pre-war times probably existing for only about three or four months in the year, during which time there might be requests for deliveries of 2000 to 3000 tons per week. The question therefore arose, Ought the material to be dried at the outset, or ought it to be stored and finally dried when the order came along? If they had to deal with such huge orders as he had mentioned—3000 tons per week—and it was decided to dry on receipt of the order, then the plant was unduly unwieldy. On the other hand, if the material was dried when manufactured, it might conceivably acquire moisture during the storage; and the whole efficacy of drying would then have been rendered nugatory. One of the technical journals recently published a description of a method of drying sulphate of ammonia mechanically; but it seemed to him that the methods adopted five or six years ago on the Continent to dry sulphate of ammonia and similar salts might be employed. A common type of dryer consisted of a jacketed trough, U-shaped, 20 ft. long by 4 ft. 6 in. deep; exhaust steam being used. The power required to drive the shovels was about 2 or 3 H.P. No attempt was made to arrange the shovels in the shape of an archimedian screw. The drying was absolutely positive, because the speed at which drying was effected depended on the angle of repose. As the sulphate of ammonia became dryer, so the angle of repose became less sheer, and the ammonium sulphate overlapped the path of adjacent shovels. Thus movement of the sulphate was secured, and the speed of operation was determined by the dryness of the salt. With regard to the drying of superphosphates, there, again, they were face to face with an important physical principle, because under certain conditions of temperature and humidity of the drying medium reversion of the soluble phosphates occurred. Instead of sending off (say) 26 p.ct. of soluble phosphates, there was only about 20 p.ct.

### The Institution "Transactions."

There has been received from the Secretary (Mr. Walter T. Dunn), who has edited the volume, the 1918 "Transactions" of the Institution of Gas Engineers, containing the report of the proceedings at the two-day annual general meeting in London last June, which was held under the presidency of the Right Hon. Lord Moulton, K.C.B., F.R.S., &c. Along with what Mr. H. E. Jones described as the classical Inaugural Address of the President, members of the Institution will value the excellent portrait of Lord Moulton which appears as a frontispiece. Turning to the sections of the book which relate to matters other than those arising out of the June meeting, one regrets to note that the Memoirs include a long list of names of men who have passed away—over twenty, as a matter of fact. Abstracts of papers, &c., appearing in the "Journal" and a few other publications up to June, 1918, were prepared by Mr. S. E. Whitehead, B.Sc.

**Midland Junior Gas Association.**—At a meeting of the Association this evening, Dr. E. W. Smith, F.I.C., the Chief Chemist to the Birmingham Corporation Gas Department, will deliver a lecture on "Gas Quality."

**Temporary Increase of Charges Act.**—The Board of Trade have made an Order for the Thurles Gas Company, Ltd., under the Statutory Undertakings (Temporary Increase of Charges) Act; and they have received an application for an Order from the Brixham Gas Company.

**Scottish Junior Gas Association (Eastern District).**—Next Saturday is the date arranged for the annual general meeting of the Association, in the Heriot Watt College, Edinburgh. In addition to the election of office-bearers, there will be an address by the President (Mr. R. B. Waddell), which will deal principally with the steaming of horizontal retorts.

# THE PART PLAYED BY COKE-OVENS AND BYE-PRODUCT PLANTS

## IN THE PRODUCTION OF MUNITIONS.

**An interesting supplement to the article which appeared on pp. 262-3 of the "Journal" for Feb. 11, relating the history of the work done during the war by the Gas Section of the Department of Explosives Supply, is provided by some facts and figures which are now available showing the important part played by coke-ovens and coke-oven bye-product plants in providing raw materials for the Ministry of Munitions.**

In the early days of the war, the Explosives Department of the Ministry of Munitions started an organization for the stimulation of bye-products and the supervision and assistance of the coke-ovens and bye-product plants from which benzol and toluol are obtained. The country was divided into districts—the Northern District, the Yorkshire District, the Western District, and the Welsh District. The Area Administrator's (of which there was one for each district) duty was to obtain returns as to the production each week, to investigate the cause of any falling-off in production at any particular plant, but most of all to render plants in his district all the assistance that lay in his power, or that of the Ministry, to secure materials for renewals and replacements of the plants. This was a most important item, as, owing to the heavy work on the machines on coke-oven plants, they are very susceptible to breakdowns; and the materials required in most cases for repairs and replacements were practically speaking unobtainable in the ordinary way. No materials could be obtained without priority certificates, so the Area Inspectors had to report upon all cases of plant, machinery, &c., required. They sent their reports to the Liaison Officer in London; and some idea of the effectiveness of this system may be gathered from the fact that one Inspector alone made over 600 inspections and recommendations in nine months of 1918, and that not a single one of these recommendations was eventually refused. Further, the Explosives Department, in conjunction with the Steel Production Department, arranged for a large number of fresh ovens to be added to existing batteries, where the recovery plants could deal with further gas with little or no alteration; and in several instances entirely new ovens and recovery plants were built. Batteries in course of completion were speeded-up; and the Inspectors of the various districts were responsible for everything in connection with this work in their particular area.

### Fire-Bricks.

To many people, the connection between fire-bricks and explosives may seem remote; but one of the most serious problems to be solved was that of keeping the coke-oven walls in proper repair. Owing to differences in the salt content of various coals, and to other reasons, the walls of some coke-oven plants deteriorate much more quickly than at other plants. In spite of this, all coke-oven companies wished to obtain, and considered they were entitled to get, the best quality bricks. Unfortunately, the supply of the best quality was strictly limited; and it was found essential that the source of supply should be controlled, and the bricks carefully rationed. By limiting deliveries in the first place to plants in what was known as the Yorkshire District, and which were the greatest sufferers, it was found possible eventually to keep up a high standard of efficiency, and even in some cases to allow consignments to be sent to areas where the conditions were unfavourable, but still not so trying as the Yorkshire District.

### Labour.

The calling-up of men from the coke-oven plants was at one time a source of grave anxiety; but arrangements were come to with the recruiting authorities, together with the representatives of the Ministry, the owners, and the unions of the men concerned, that 10 p.ct. should be called-up from the total number of men employed. It was part of the Inspectors' duties to confer with the Munitions Area Dilution Officers, trade union officials, and other authorities, to see that this was done with the minimum amount of dislocation to the industry.

### Production.

Some idea can be formed of the success as a whole of the policy of the Department from the following figures, which represent the amount of crude 65's benzol recovered from coke-ovens alone. The figures for 1913 are only approximate, as detailed records for that year are not in existence; but they have been very carefully estimated, and can be taken as substantially correct.

*Crude Benzol from Coke-Ovens.*

| | Gallons. |
|---|---|
| 1913 (estimated) | 18,920,000 |
| 1914 (actual) | 21,877,000 |
| 1915 ,, | 25,148,000 |
| 1916 ,, | 31,081,000 |
| 1917 ,, | 33,552,000 |
| 1918 ,, | 32,162,000 |

It will be noticed that there is a falling off in production in 1918, which was due to two causes—(1) the very serious shortage of coal, which affected every industry; and (2) the signing of the armistice, after which the production fell rapidly.

### Detailed Figures showing the Production of Coke and Bye-Products from Patent Coke-Oven Plants in the United Kingdom for the Years 1917 and 1918.

**1917.**

| District. | Coal Carbonized. | Crude 65's Benzol Produced. | Gallons per Ton. | Coke Produced. | Tar Produced. | Sulphate of Ammonia Produced. | Concentrated Ammonia 25 P.Ct. Produced. |
|---|---|---|---|---|---|---|---|
| | Tons. | Gallons. | | Tons. | Gallons. | Tons. | Tons. |
| Northern Area— | | | | | | | |
| Scotland | 524,155 | 1,518,747 | 2·87 | 425,012 | 3,551,669 | 9,240 | 1,491 |
| Durham | 6,923,415 | 13,290,272 | 1·92 | 3,901,837 | 47,926,549 | 59,327 | 9,759 |
| Yorkshire Area— | | | | | | | |
| Yorkshire | 3,095,830 | 8,587,929 | 2·81 | 3,038,663 | 24,518,177 | 22,089 | 10,177 |
| Derby, Lincs., and Notts | 1,071,939 | 2,716,579 | 2·54 | 724,859 | 6,847,314 | 8,655 | 4,361 |
| Western Area— | | | | | | | |
| Cumberland | 777,048 | 2,024,762 | 2·61 | 539,882 | 6,561,967 | 9,462 | .. |
| Lancashire and Cheshire | 686,029 | 1,257,428 | 1·83 | 474,899 | 4,410,066 | 4,126 | 3,852 |
| Shropshire, Staffs, and Worcester | 933,878 | 2,432,288 | 2·61 | 699,597 | 6,403,013 | 6,508 | 801 |
| South Wales Area— | | | | | | | |
| Denbigh, Glamorgan, Monmouthshire, and Somerset | 1,202,973 | 1,724,786 | 1·36 | 1,061,894 | 6,830,377 | 6,280 | 3,021 |
| Total | 15,275,267 | 33,552,791 | 2·18 | 10,866,673 | 107,079,162 | 125,587 | 33,462 |

**1918.**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Northern Area— | | | | | | | |
| Scotland | 554,565 | 1,636,974 | 2·94 | 416,166 | 3,414,955 | 10,641 | 406 |
| Durham | 6,640,501 | 12,933,374 | 1·94 | 4,552,876 | 45,738,476 | 63,920 | 2,587 |
| Yorkshire Area— | | | | | | | |
| Yorkshire | 3,130,178 | 8,354,095 | 2·66 | 2,269,895 | 23,909,852 | 26,679 | 7,817 |
| Derby, Lincs., and Notts | 991,643 | 2,447,358 | 2·46 | 677,439 | 6,335,290 | 9,306 | 3,387 |
| Western Area— | | | | | | | |
| Cumberland | 680,312 | 1,740,091 | 2·55 | 470,400 | 5,834,492 | 8,593 | .. |
| Lancashire and Cheshire | 667,682 | 1,355,213 | 2·02 | 470,911 | 4,511,131 | 1,593 | 4,739 |
| Shropshire, Staffs, and Worcester | 861,944 | 2,272,485 | 2·63 | 631,080 | 5,759,658 | 5,215 | 2,949 |
| South Wales Area— | | | | | | | |
| Denbigh, Glamorgan, Monmouthshire, and Somerset | 1,108,578 | 1,422,808 | 1·28 | 1,043,871 | 7,277,836 | 8,500 | 2,014 |
| Total | 14,635,403 | 32,162,598 | 2·18 | 10,552,648 | 102,781,690 | 134,357 | 23,899 |

The increase in the number of bye-product ovens in operation is shown by the following table.

*Number of Bye-Product Ovens in Operation.*

| | |
|---|---|
| July 31, 1914 | 5893 |
| ,, 1915 | 6491 |
| ,, 1916 | 7719 |
| ,, 1917 | 8219 |
| ,, 1918 | 8412 |

There were 1253 further ovens in course of construction when the armistice was signed.

When it is remembered that, in the most favourable circumstances, a battery of coke-ovens and the necessary bye-product plant can scarcely be constructed in less than eighteen months to two years, the record set out here is one calculated to afford considerable gratification.

## TOLUOL RECOVERY IN THE UNITED STATES.

Messrs. R. S. M'Bride, C. E. Reinicker, and W. A. Dunkley, of the United States Bureau of Standards, in Technological Paper No. 117, deal with the relation of toluol recovery to standards for gas service. During the war, many inquiries reached the Bureau from State and municipal authorities who were asked to facilitate toluol recovery by modification of the standards in force under their jurisdiction; and in order that they might be fully informed as to the technical problems involved in these questions, the Bureau had investigations made which resulted in the issue of a report that was summarized in the "JOURNAL" for March 12, 1918 [p. 494]. The present paper includes this report (which deals with toluol recovery and standards for gas quality), as well as another section giving a description of toluol plant construction and methods of operation, a review of the various results that can be obtained, and a brief outline of the cost of carrying out the recovery. Arising out of the results of the investigations published, the following suggestions are offered as being desirable adjustments to facilitate the recovery of toluol: (1) Eliminate all candle-power requirements now in force, except for the cities where 18 candles or higher has been supplied, in which localities an understanding should be reached that at least 12 candles will be maintained for a period—say, a year—during which readjustments of appliances and the substitution of mantle-lamps would be accomplished to such an extent as to justify complete elimination of candle-power regulations. (2) For plants making coal gas (or practically only coal gas), let the heating value standard be from 550 to 570 B.Th.U. (3) For plants making water gas, either alone or as a major constituent, let the heating value standard be 570 to 600 B.Th.U. monthly average total heating value; the adjustment being made between these limits according to the economic conditions of operation.

### The New Manager of the National Benzol Company.

Mr. Charles W. Turner has been appointed General Manager to the National Benzol Company, Ltd. Although only 37 years of age, Mr. Turner has had 15 years' experience in the distribution of oils and other products. He was formerly a member of the Vacuum Oil Company. During the war Mr. Turner served as Section Director in charge of the Railway and Distribution Branch of the Explosives Department, in which position he was directly responsible to the Deputy Controller for the control and operation of 4000 railway wagons carrying coal, toluol, benzol, poison gas, nitrate of ammonia, &c., and had a large staff of Area Traffic Officers under his control in various parts of the United Kingdom. Early in 1918 the War Office especially requested the Minister of Munitions to take a census of all tank-wagons and tank-wagon traffic in Great Britain. This task was entrusted to Mr. Turner, who prepared an exhaustive memorandum on the subject for an important conference which was held to investigate the question of tank-wagon control. The advantage of this census became apparent in the critical days of September, 1918, when the shortage of tank-wagons became so acute in France that M. Clemenceau specially wired the Prime Minister to at once dispatch a large number of these vehicles to France to ensure supplies of motor spirit in the front line. A meeting was immediately called to consider the matter, and Mr. Turner was deputed to furnish particulars of suitable tank-wagons for the work. This was done, and the tank-wagons were commandeered by telegram. For his services at this crisis, Mr. Turner received the warm thanks of his chiefs. Though he has a heavy task before him in organizing the distribution and transport of benzol, Mr. Turner enters upon his new duties with every confidence that he will shortly succeed in securing an efficient supply of benzol available in every town and village in the United Kingdom.

There was not time to take the following papers at last week's meeting of the London Section of the Society of Chemical Industry; and they were accordingly held over until next month: "The Estimation of Carbon Disulphide—A Critical Examination of the Various Methods usually employed," by Dr. Percy F. Spielmann and Mr. F. Butler Jones, B.A.; "Estimation of Thiophene," by Dr. Spielmann and Dr. S. P. Schotz; and "Estimation of Free Carbon in Tar and Pitch," by Dr. Spielmann and Mr. Henry Wood.

# CORRESPONDENCE.

[*We are not responsible for opinions expressed by Correspondents.*]

### Gas Investigation Committee.

SIR,—I am sending out the sheet enclosed to members of the Institution of Gas Engineers and others who may be interested. Since, however, it is practically impossible to do so without leaving out some name which ought to be included, I shall be greatly obliged if you will grant the publicity of your columns to the notice.

JOHN W. COBB,
Secretary of the Research Sub-Committee.

*The University, Leeds, April* 10, 1919.

[ENCLOSURE.]

RESEARCH SUB-COMMITTEE OF THE GAS INVESTIGATION COMMITTEE (INSTITUTION OF GAS ENGINEERS).

Dear Sir,—As is probably known to you, this Committee is engaged in making experiments and inquiries as to the relative efficiencies of different grades of gas in use in various appliances.

It is quite possible that you have made tests, the results of which would be of service to the industry and to us in arriving at a correct conclusion, and which you would be willing to place in our hands, in as precise a form as possible—saying at the same time the degree of privacy which you wish to attach to them, if for any reason you feel that they cannot be placed unreservedly at the disposal of the Committee.

When some special advantage is claimed for an appliance, gas quality, or manner of use, will you kindly state whether you are prepared to submit to the Committee a sample of the appliance or particulars of the improvement, together with full details as to gas quality, manner of use, &c., so as to allow a verification of the claim by independent investigation, and an experimental inquiry into the cause of any increased efficiency.

It will, of course, be understood that the Committee decides whether the tests are within its range, what tests shall be made, and in what order.

For purposes of ready comparison with one another, and with results which the Committee has obtained for itself, it is suggested that such particulars as are tabulated below should be given if possible, along with any others which seem to be relevant.

Please address any reply to Professor Cobb, The University, Leeds, in an envelope marked "Gas Research."—Yours faithfully,

(Signed) JOHN W. COBB,
Secretary of the Research Sub-Committee.

RING-BURNERS—WATER-BOILING TESTS.

Calorific value (gross and net) of gas used.
Composition of gas and density.
Pressure of gas in inches of water.
Position at which pressure is taken relative to the appliance.
Size and description of burner.
Size and description of kettle.
Height of kettle bottom above burner.
Weight of water heated, and between what temperature limits.
Volume of gas burned, as indicated by meter.
Volume of gas corrected to 60° Fahr. and 30 in., wet.
Corrected gas-rate per hour.
Other particulars as desired.

GAS-FIRES.

Calorific value (gross and net) of gas used.
Gas composition and density.
Gas pressure in inches of water.
Position at which pressure was taken.
Description of fire—by name or in other terms.
Numbers of burners or radiants.
Nominal gas consumption per hour per burner or for fire.
Actual gas consumption per hour in test.
Percentage radiant efficiency.
Method of testing.
Apparatus.—Thermopile.
Bolometer.
Richmond radiometer.
R. H. Smith radiometer.
Or other appliance.
Other particulars as desired.

INCANDESCENT MANTLE-BURNERS—LOW PRESSURE.

Calorific value (gross and net) of gas used.
Gas composition and density.
Gas pressure in inches of water.
Position at which pressure was taken.
Description of burner—inverted or upright.
Nominal gas consumption per hour.
Actual gas consumption per hour in tests.
Candle power developed—Is this a maximum or value of maximum efficiency, or an arbitrarily chosen candle power?
B.Th.U. per candle-power-hour.
Candles per cubic foot—How measured and in what direction?
Other particulars, especially with regard to sooting, aëration, and lighting-back difficulties.

Where adjustments have been made to appliances (such as opening-out or closing injector), it is requested that such should be noted.
Where complete analysis of a gas is not available, a statement of the "inerts" is of value.
The inquiry is not confined to the few typical appliances mentioned above.

## Salaries and Service Conditions of Local Government Officers.

Sir,—I have been interested in your editorial of March 25 last, on the organization of gas officials, and the correspondence which has appeared in subsequent issues.

I should like to draw your readers' attention to the National Association of Local Government Officers, which includes in its membership the whole of the administrative, technical, and clerical staffs of gas departments of local authorities. My Association has secured war bonuses for local government officers with more or less general satisfaction to all concerned. We are now engaged in deciding upon a salaries campaign which we hope will secure for all local government officers an adequate increase to meet the reduced value of incomes arising from the present economic conditions. This general campaign will be closely followed by special consideration of the position of the underpaid members of the service; and the whole campaign will no doubt be brought up before the triple scheme of Whitley Councils, which we are now engaged in setting-up for the local government service.

I have no doubt that a large number of your readers are engaged under private gas companies. I am therefore now appealing solely to the local government officers to support the "N.A.L.G.O." Although the local government service is made up of officers engaged in different professional and sectional occupations, there is a general vein of service conditions running through the whole of the corporation staffs; and these conditions can only be dealt with adequately by an organization solely comprised of public officers. We have also to remember that there are other service conditions to which we attach considerable importance, such as superannuation and tenure of office.

My Association has, after many years' very hard work, secured the establishment of a Departmental Committee on Superannuation; and the future in this respect is brighter than before the war.

I shall be pleased to give full information relating to the work and aspirations of the Association if any of your readers will communicate with me.

L. Hill, General Secretary,
National Association of Local Government Officers.

*Caxton Hall, Westminster, S.W.,*
*April* 9, 1919.

## Salaries in the Gas Industry.

Sir,—I have been very interested in the correspondence on the above subject, and would like to give my experience.

Since August, 1914, the increase to the manager has been 35 p.ct., to the clerks 15 p.ct., to stokers, yardmen, &c., 109 p.ct. It certainly is time action was taken to have some kind of equality. On every occasion, the increase to the workmen was given to compensate them for the increased cost of living.

Personally, I will give any assistance that lies in my power to form some kind of union, as union and force are the only arguments understood by some gas committees.

Union.

*April* 4, 1919.

## Making Gas, and Selling on a Heat-Unit Basis.

Sir,—Dr. Carpenter's article originated in your contemporary; and, following its first instalment, I wrote—on March 10—a letter suggesting the importance of a basis on which the gas and electrical units should be approximately the same. I feel that any other departure from our present arrangement would serve no useful purpose, but would rather tend to add confusion to the selling of gas.

Before one can get down to a definite suggestion, it will be necessary to know what will be our future heat standard, and whether it will be applied generally, or its acceptance be optional. This question is, I believe, at the present moment *sub judice;* but, I venture to think the sooner it emerges from that state and becomes a settled fact, the better—for the 1st of July is at hand.

R. W. Edwards.

*Gas Offices, Aldershot, April* 10, 1919.

## The Gas of To-day.

In a note bearing this heading, the "Ironmonger" says: Among the minor worries which the householder has had to tolerate during the war has been that of persistent "back-lighting" in his gas-stove, often violent and noisy enough to put terror into the hearts of his women-folk, already, in many cases, somewhat shaken in their nerves by other noises. While back-lighting may often be due to want of cleanliness, our gas authorities candidly admit that the real explanation of the war-time epidemic lies in variable and inferior gas. We have had to put up with this worry in order that certain elements could be taken out of the gas for the manufacture of high-explosive shells. It will not be easy to get back all at once to pre-war conditions; and while we are in a state of transition, the Institution of Gas Engineers are very wisely advocating an important reform, neither more nor less than the universal standardization in this country of the public gas supply, which is not to be based on candle power, but upon heat value. Now that electric light is so employed and gas for lighting used with the incandescent mantle, heat value, and not light value, might safely be made the standard measure. The standard will probably be fixed somewhere in the neighbourhood of 525 B.Th.U. gross, because this represents the most efficient measure in relation to the gas mantle. It is claimed, and probably rightly, that a universal standard in composition and quality at a proper price would be equally to the advantage of the consumer and the gas producer. The former would no longer be troubled by having to make adjustments of his burners, and would obtain the highest possible heat value for his money; while the latter would be able to effect important economies by standardization of methods of production.

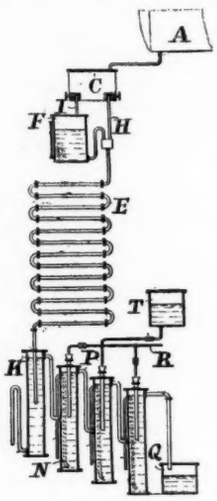
# REGISTER OF PATENTS.

## Purifying Benzol and Washing and Mixing Two Liquids of Different Specific Gravity.—No. 123,839.

Blyth, M. W., and Miles, T. V., of Thorncliffe, near Sheffield.

No. 4237; March 11, 1918.

This invention relates to apparatus for washing or purifying benzol and other oils, carbolic acid, and tar acids generally. The object of the inventors is to provide a process wherein the unpurified liquid is admitted to the apparatus without interruption, and is conducted through a series of vessels where it is brought into contact with the purifying reagents and is finally discharged in a continuous stream, and wherein the use of mechanical stirrers or agitators is avoided. The apparatus may be employed for washing or purifying benzol, petroleum, or paraffin with sulphuric acid, soda, or the like; for the extraction of carbolic acid and tar acids generally from coal tar by means of soda; for the purification of low-temperature tar from unsaturated hydrocarbons by means of sulphuric acid; and for the treatment of other materials susceptible to such processes.




**Blyth and Miles' Benzol Purifying Apparatus.**

The invention is described (by way of example) in its application to the washing and purifying of benzol, and a diagrammatic elevation of plant for this purpose is given.

A is a storage tank connected to a regulating tank C provided with two outlets controlled by valves. One of these controls the flow of benzol to the upper end of a coiled or convoluted pipe E; and the other, the flow to a tank F, containing sulphuric acid or other reagent. The lower part of the tank is connected by an overflow pipe to the upper end of the pipe E. When the valves are open benzol flows from the tank C directly into the coil E through the pipe H, and at the same time it flows through the pipe I to the tank F and accumulates on the surface of the reagent contained in it. An amount of the reagent corresponding to the weight of benzol admitted to the tank F will thus be forced out through the overflow pipe into the pipe E. The proportions of benzol and sulphuric acid, or other reagent, supplied can in this way be determined by suitable adjustment of the valves.

Having passed through the coil E (wherein the reagent effects a purification of the benzol flowing along in contact with it), these materials enter a receiver K, from the lower end of which the spent reagent is drawn off through an overflow pipe. The supernatant benzol passes from the upper part of the receiver to a washing vessel N, which it enters at a point below the level of the purifying reagent contained in it. The foul water or spent reagent is drawn off from the bottom of this washing vessel through an overflow pipe, and the benzol is drawn off from the top of the vessel through a pipe P. The benzol passes successively through a number of such washing vessels provided with overflow pipes and benzol pipes, and is finally delivered to a purified benzol receiving tank. The washing vessels are, some of them, supplied with water from a pipe R in regulated quantities and others with caustic soda solution from a tank T under the control of a valve.

## Distributing Liquids in Gas-Scrubbers. No. 123,879.

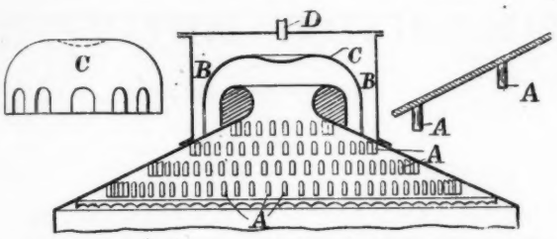
Dent, J. H., and the United Alkali Company, Ltd., of Liverpool.

No. 6598; April 18, 1918.

This apparatus is designed to utilize the surface tension of liquids for the purpose for which it is employed. It comprises a cone with a number of projections on its underside and with the apex removed and the upper edge rounded, and surrounded by a trough in which is a dome, preferably having a depressed upper part and openings around its bottom edge, which is immersed in liquid in the trough to prevent the escape of gas by the liquid luting the openings.

The device shown is presumed to be applied to the upper part of a scrubber provided with inlets and outlets for the gas in the usual way. The dome is also shown separately, as also the projections on the underside of the cone.

The cone has a number of projections A from its underside, while its apex is absent, and the rounded edge is surrounded by a trough B, in




**Dent's (United Alkali Company) Liquid Distributor for Gas-Scrubbers.**

which is a dome C, having a depression in its upper part and openings around its edge, which is immersed in liquid maintained at a sufficient level in the trough to constitute a luting and so prevent the escape of gas through the openings. The liquid to be distributed is fed into the depressed part of the dome and passes into the trough B, and thence over the rounded upper of the cone. The liquid spreads over the inner side of the cone and drips from the projections on the underside of it. The projections are disposed so as to give a practically uniform distribution of the liquid. The pipe D, which supplies liquid to the apparatus, is connected to a cover enclosing the dome and the trough B as shown.

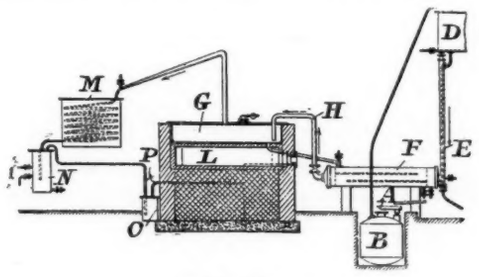
## Tar-Still.—No. 123,880.

Archer, J., of Stockton-on-Tees.

No. 6667; April 19, 1918.

There is, the patentee remarks, considerable difficulty in distilling wet tar—particularly such as is condensed from Mond producer gas—"due to the fact that the water is so emulsified with the tar that no mechanical method of separation has succeeded, and that separation by boiling a large bulk in an ordinary form of pot-still is attended by grave difficulties, such as frothing."

The present invention relates to plant for the distillation of wet tar containing up to 40 p.ct. of moisture. It has the usual flat bottomed form, but is shallower. The tar flows through it in a zig-zag course, owing to the sub-division of the chamber by partitions; but the latter are set close together, so as to narrow the path. The transmission of heat is aided by fins arranged on the inside of the bottom of the chamber and extending for a suitable distance into the body of the tar.




**Archer's Tar-Still.**

An elevation of such a plant is shown diagrammatically in longitudinal section.

The crude tar is run into a trough A, which feeds it to the egg B internally heated by steam admitted above the surface of the tar, so that it is raised to the tank D heated by a steam-coil. The hot water from the coil flows down a pipe placed co-axially in the pipe E, which conveys the tar to the heat interchanger F. Through the latter the tar flows to the still G by way of the pipe H. The still is subdivided by partitions which compel the tar to take a zig-zag course from the inlet to the discharge pipe, by which time it is "substantially pitch." It is delivered to the heat interchanger F, through which it flows in a contrary direction to the crude tar and finally runs away to the pitch bed.

The characteristic features of the still are the fins along the inner surface of its bottom. These are of about the same depth as the layer of tar which flows through the still—preferably 4 to 6 in.

The heating is by a gas-furnace; the products of combustion travelling along zig-zag flues L beneath the still. The gases and vapours pass from the still to the condenser M, which the condensate collects in the closed pot N, in which the oil separates from the water—the two layers flowing away by separate pipes. The gases pass from the pot to a lute O, whence a pipe P conveys them to the furnace.

## Carbonization of Coal and Other Bituminous or Organic Materials.—No. 124,039.

Beilby, Sir G. T., of Great George Street, S.W.

No. 4287; March 12, 1918.

In apparatus for the heat treatment of materials, the patentee points out, it has been proposed to place the material to be treated on the floor of an annularly-shaped stationary or revolving chamber, around which the products of combustion from a heating furnace circulate; the material being distributed and finally discharged by a number of scrapers within the chamber and having motion relatively to it. The object of the present invention is "to obtain carbonization of the material at minimum temperatures, in an efficient manner, and with economy of time, labour, and fuel."

The proposal is to carbonize the material by exposing it in thin layers to the action of heat in shallow trays in which it is spread; "the trays being subjected to the action of heat while they are rotated in a horizontal plane, the period of rotation being such that complete carbonization occurs during a portion of the rotation somewhat less than a complete revolution." The invention also consists in automatically charging and discharging the trays which during the whole process of carbonization are "exposed to the action of heat of the desired intensity conveyed by radiation, convection, and conduction from the walls of a gastight casing in which the trays are disposed."

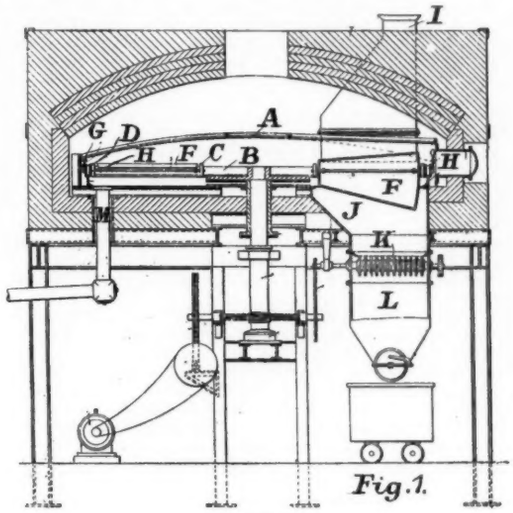



Fig. 1.

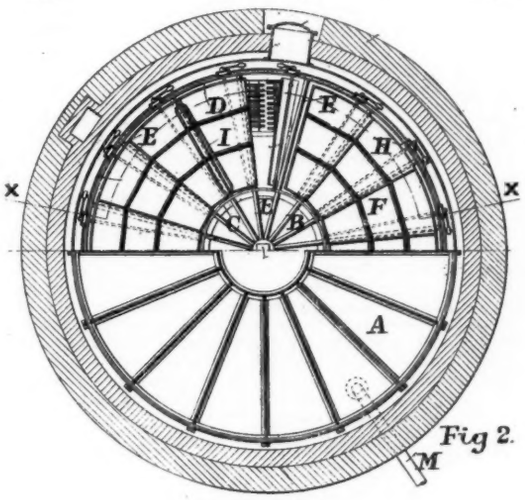



Fig 2.

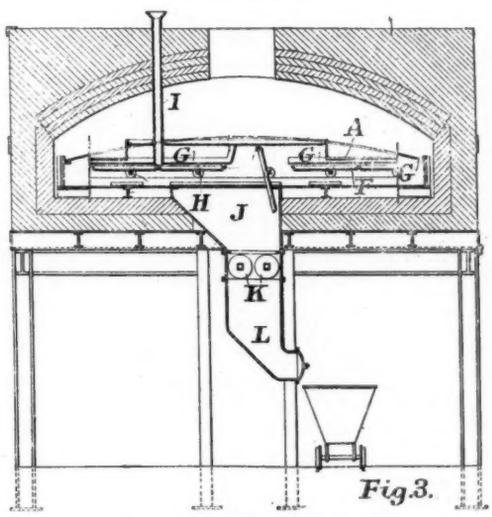



Fig. 3.

**Beilby's Coal Carbonization Apparatus.**

Fig. 1 is a sectional elevation of the apparatus, fig. 2, a sectional plan, and fig. 3, a section line X of fig. 2.

Enclosed within a brick chamber is a gastight casing A containing a rotating frame B on which the trays carrying the material to be carbonized are mounted. A vertical shaft supported by a bearing projects upwardly into the casing through a gland, which also extends through the bottom of the chamber, so that it is not reached by the high temperature gases. The frame, fitted on the upper end of the shaft, con-

sists of inner and outer circular rings C and D connected by radial spokes E, of angle iron or the like. Between the rings are fitted the trays F by means of rods pivoted to the rings, and forming an axis about which the trays can swing; and being placed to one side of the centre line of each tray, the tray tends to assume a vertical position. This is prevented by means of rollers carried by the trays and bearing on the under side of a circular rail G. As shown in fig. 3, this rail is, however, interrupted at one point of its circumference—allowing the trays successively to assume the vertical position to discharge their contents. They are returned to the horizontal position by the rollers encountering an upturned portion of the rail, and remain horizontal during the greater part of the revolution of the frame, the weight of which is supported by rollers H running on a rail, as well as by the central shaft.

The material to be carbonized is placed in a hopper I provided with a shoot of the elongated shape shown, so that the whole radial length of each tray is covered. The plane of the lower edge of it is parallel to the direction of motion of the trays, and is placed close to them, but with a small clearance which may be modified to suit the type of material being carbonized. There is thus no room between the tray and the shoot for the material to form a heap; and the material deposited immediately beneath the shoot automatically prevents any more descending until the tray has moved to bring a fresh vacant space underneath it. By this means a uniform thin layer, without heaps, is spread over each tray.

Fig. 2 shows that the motion is in counter-clockwise direction, so that the material is under the action of heat during the greater part of a complete revolution of the frame B.

Discharge of the material which has been carbonized takes place into a hopper J leading to crushing rollers K, after which it is discharged either continuously or intermittently from a shoot L. The gaseous products are conveyed away from the casing by pipes M.

### Electric Switches for Retort Plant.—No. 124,066.

Drakes, Ltd. and Drake, J. W., of Ovenden, Halifax.

No. 4965; March 21, 1918.

This invention relates to electric switches for controlling motors—such, for instance, as those used in breaking coal and conveying and charging it to gas-retorts. In such machines it is often found, the patentees point out, that when an accident happens to one part so that it is unable to perform its functions in the sequence of operations, the other parts of the apparatus, by continuing to feed the material, may cause serious damage by choking it—thus entailing "considerable loss of time and expense in bringing the several machines back to their normal operating conditions." In connection with this type of apparatus, what is usually termed a "no-volt" coil is used, which under certain conditions causes the release of the starting switch arm to put out of action the particular motor controlled by the switch.

The present invention consists in applying to such switches, other or additional switches, keys, or cut-outs, which are wired in such a manner relatively to the neighbouring switches, that, should an accident happen to one set of apparatus which causes the "no-volt" coil or "over-load" switch to be operated so as to cut off current to the motor driving it, this will cause the additional switch or cut-off in connection with the starting switch of the machine before it (or the machine which would in the ordinary way feed material to it) to be thrown out of action, and this cutting-out of action of the motors will be repeated in succession in connection with each set of apparatus or each machine in the series leading up to the one first rendered inoperative.

## APPLICATIONS FOR PATENTS.

**[Extracted from the "Official List" for April 9.]**

Nos. 7980—8669.

Anderson, R. J.—"Combustion of fuel." Nos. 8570, 8571.
Anderson, W.—"Treatment of coal tar, &c." No. 8414.
Brockway, F. G.—"Apparatus for washing and scrubbing coal gas, &c." Nos. 7986, 7987, 8059.
Brockway, F. G.—"Pan scrubbers, &c." No. 8058.
Calvert, G.—"Production of cyanide." No. 8416.
Challenor, A. E.—"Acetylene generators." No. 8112.
Chinn, S. A.—"Multiple-way control taps for liquids." No. 8512.
Commin, F. J.—See Calvert. No. 8416.
Cowdell, J. W.—See Chinn. No. 8512.
Cubley, H.—"Gas-heated crucible furnaces." No. 8117.
Dolphin, J.—"Gas-regulators for gas-burners, &c." No. 8270.
Elektrizitätswerk Lonza.—"Acetylene generators." No. 8663.
Gardner, W.—"Suction-gas producers." No. 8543.
Harvey & Co., M.—See Cubley. No. 8117.
Howlett & Co., M.—See Dolphin. No. 8270.
Hunter, H. E.—See Gardner. No. 8543.
Jack, J. W.—"Gas-turbine." No. 8095.
Lindsay Light Company.—"Manufacture of thorium compounds." No. 8585.
M'Minn, S. A.—"Pusher-head for discharging gas-retorts." No. 8030.
Morris, M.—"Tar distilling." No. 8525.
Shaw, A. Herring-.—"Heat deflectors applicable to gas stoves or pans." No. 8630.
Smith, D. J.—"Gas-producers." No. 8662.
Smith, H. C.—"Gas burners." No. 8313.
Spicer, Sir H. H.—"Gas-producers." No. 8193.
Tribe, E.—"Pipe joint." No. 8510.
Van Sicklen Co.—"Apparatus for delivering gas." No. 8442.
Wells, J. F.—See Spicer. No. 8103.
White, A. E.—See Van Sicklen. No. 8442.
Wimshurst, A. L.—"Device for lighting burners of acetylene, gas, &c., lamps." No. 8644.
Woollen, H.—See Challenor. No. 8112.

# PARLIAMENTARY INTELLIGENCE.

## HOUSE OF LORDS.

### Progress of Bills.

The South Shields Gas Bill and the Stourport Gas Bill were reported, with amendments.

The Sheringham Gas and Water Bill and the Stockton-on-Tees Corporation Bill are among the measures referred to a Select Committee consisting of Lord Queenborough (Chairman), Earl Strafford, Lord Monson, Lord Blythswood, and Lord Loch—to meet on May 13.

In place of Lord Kintore, Lord Muir-Mackenzie will act as Chairman of the Select Committee to whom the Huddersfield Corporation Gas Bill, the Newark Gas Bill, and the Pembroke Gas Bill have been referred.

### South Shields Gas Bill.

This Bill (promoted by the South Shields Gas Company) was before the Unopposed Bills Committee of the House of Lords on Tuesday last. The measure passed the House of Commons last session.

Mr. Browne (Messrs. Dyson & Co., Parliamentary Agents) explained that the Bill had been promoted last year, but had been held over until this session on account of protracted negotiations with the Local Authorities. The matters in dispute—which, it is understood, were all small points of detail—had been arranged. Within the past few days, however, an important question had been raised by the Home Office with regard to the power taken to utilize power gas for illuminating purposes by means of incandescent mantles. The clause dealing with this matter has now been eliminated from the Bill.

The Bill was ordered to be reported for third reading.

### Stourport Gas Bill.

The Unopposed Bills Committee of the House of Lords on Tuesday last sent the Bill promoted by the Stourport Gas Company forward for third reading. The Bill proposes to convert the present limited Company into a statutory undertaking and to extend the limits of supply. The capital of the limited Company is £6600; but new money powers to the extent of £33,000 are given. The Bill contains the usual clauses for the proper carrying on of a statutory gas undertaking.

## HOUSE OF COMMONS.

### Progress of Bills.

The Northampton Gas Bill and the Bournemouth Gas and Water Bill were reported, with amendments.

### Brentford Gas Bill.

The Lords' amendments to the Brentford Gas Bill were considered and agreed to.

### London and District Lighting Regulations.

Mr. Gilbert asked the President of the Board of Trade when it was proposed to withdraw the present regulations of control over the supply of gas and electric lighting in London and district.

Mr. Bridgeman (the Parliamentary Secretary to the Board) replied that the question of suspending the present control of gas and electricity during the coming summer months was engaging the attention of the Controller of Coal Mines. A definite decision in the matter would be reached about the close of the present month.

### Report of the Coal Commission Evidence.

Brigadier-General Cockerill asked the Prime Minister if he could state when the full report of the evidence taken before the Coal Commission would be printed and published.

Sir R. Horne, who replied, said that the evidence taken prior to the interim reports, together with the appendices, was being prepared for publication, and would be issued as soon as possible.

### Electricity Supply Bill.

Captain Ainsworth asked the Prime Minister whether the Board of Trade Electricity Supply Bill would be presented to Parliament at an early date, in view of the fact that the Board of Trade Bill had been prepared as the outcome of a unanimous report of their Committee after full consideration extending over three years.

Mr. Bridgeman, who replied, said he hoped it might be possible to present the Bill before the House adjourned for the Easter recess, or very soon after the recess.

## BOURNEMOUTH GAS AND WATER BILL.

When the Committee presided over by Sir Harry Samuel met on Wednesday last, after an adjournment since April 2 [*ante*, p. 103], they were informed that agreements had been reached with the Corporations of Poole and Bournemouth on the remaining matters on which they opposed the proposals of the Bournemouth Gas and Water Company.

Mr. Browne (Messrs. Dyson & Co., Parliamentary Agents) stated that, in order to meet the objections of the Poole Corporation, the new capital sought by the Bill had been reduced from £800,000 to £600,000—£450,000 share, and £150,000 loan. It had also been agreed with the Bournemouth Corporation that the pressure of gas supplied in both Bournemouth and Poole should be not less than 20-10ths, instead of 15-10ths as provided by the Company's Order.

Amendments to carry out these agreements, and also to give effect to the Committee's previous decision in regard to the site and the coal-conveyor, were brought up and passed by the Committee.

Mr. G. Pritchard (Parliamentary Agent), on behalf of the Cor-

poration of Bournemouth, said the amendments with regard to capital and pressure satisfied all the criticisms they had made, and they considered that they had been met very fairly. The Corporation desired him to say that their relations with the Company had always been very friendly, and they wished to preserve this relationship.

The Chairman said the Committee were glad that a friendly arrangement had been come to, and hoped that the relations which existed between the Corporation and the Company would continue.

The preamble of the Bill was declared to have been proved; and the Committee ordered it to be reported for third reading.

# MISCELLANEOUS NEWS.

## DISCHARGE OF GAS LIQUOR INTO SEWERS.

In a report to be submitted at to-day's meeting of the London County Council, the Main Drainage Committee state that they have had under consideration an application made by the Gas Light and Coke Company to discharge certain waste gas liquor into the Northern outfall sewer adjoining the Company's works at Beckton. The liquor is produced as a waste after the ammonia and other impurities have been extracted. For many years it has been discharged into settling-ponds, and the effluent has flowed into the River Thames. The settling-ponds are now filled up, and no other land is available for the purpose. Chemical examination of the liquor has been made by the Council's officers, and there does not appear to be any vital objection to its introduction into the sewage; nor will the condition of the river be worsened, as the effluent will continue to flow into it, whether direct from the Company's works or through the Council's system. The quantity of liquor dealt with is comparatively small; being only about 200,000 gallons a day, or about $\frac{1}{750}$th of the sewage flow, and the resulting amount of sludge for conveyance to sea will be about 1000 tons a year.

Negotiations have taken place with the Company's representatives with regard to the conditions upon which the liquor shall be discharged into the outfall sewer; and an arrangement, which the Committee are of opinion is satisfactory to the Council, has been tentatively arrived at. Under this arrangement, the Company will pay a sum of £1350 for the first year; and thereafter the amount of payment will be revised annually, having regard to the cost of disposal of the liquor at the Council's works. The arrangement may be terminated by the Council at one month's notice; but if such notice is not given before two years, the arrangement shall be subject to determination by one year's notice by either party. The Company will carry out, at their own cost, all works necessary for delivering the liquor into the sewer to the Council's satisfaction. Facilities will also be given for the Council's officers to examine the quantity and quality of the liquor.

The Committee therefore recommend that the Company be allowed to discharge their spent liquor into the sewer on these terms.

## THE GAS INDUSTRY AND INDUSTRIAL COUNCILS.

### Municipal and Company-Owned Undertakings.

There was held at Caxton Hall, Westminster, last Friday, the first meeting of the Joint Industrial Council for local authorities, non-trading services representing local authorities as employers, and the manual workers employed by them, other than those represented on other Joint Industrial Councils. The following is taken from an official report since issued.

Mr. G. J. Wardle (the Parliamentary Secretary to the Ministry of Labour) pointed out that this was the thirty-first Joint Industrial Council to be formed, and it was the second Council set up for industries in which local government authorities were concerned. The fact that the present Council concerned local government authorities throughout England and Wales made it desirable that some account should be given of the steps that had been taken to apply the Whitley report to the industries and the services with which such authorities were concerned. Paragraph 24 of the second Whitley report read as follows:

> In considering the scope of the matters referred to us, we have formed the opinion that the expression "employers and workmen" in our reference covers State and municipal authorities and persons employed by them. Accordingly, we recommend that such authorities and their workpeople should take into consideration the proposals made in this and in our first report, with a view to determining how far such proposals can suitably be adopted in their case.

The Ministry of Labour accordingly got into touch with leading people in the municipal world with regard to the question of the application of the principle of Joint Industrial Councils to the industries and the services in which local government authorities were concerned. At the beginning of this inquiry, it was found that there was a weighty body of opinion in the municipal world in favour of setting-up a Joint Industrial Council for each local government authority, with representatives of the authority on one side and representatives of all the employees of the authority on the other side. The Ministry of Labour fully realized the difficulties in regard to such a plan of operation—namely, (*a*) the different local government authorities would set up local Joint Industrial Councils on different bases, some of them recognizing trade unions and others not, and (*b*) that such a method would run counter to the industrial basis which was a fundamental principle of the Whitley report, and would further mean that the company-owned undertakings—such as gas, water, tramways, and electricity supply—would have to form separate Joint Industrial Councils on their own. Interviews were therefore held with the Association of Municipal Corporations and with leading members of the various Associations which represent the interests of company-owned undertakings in gas, water, tramways, and electricity supply. The Association of Municipal Corporations appointed a special representative committee of fifteen persons; and a representative of the Ministry of Labour was invited to attend the meetings of this Committee.

#### Councils for Gas and Electricity.

After careful consideration of the matter, the Committee came unanimously to the conclusion that there should be separate Joint Industrial Councils set up for (*a*) gas, (*b*) water, (*c*) tramways, (*d*) electricity supply, and that on each of these councils the representatives on the employers' side should be elected by the Associations representing municipal undertakings and company-owned undertakings. This Special Committee presented a report to the above effect to the Association of Municipal Corporations; and the report was adopted unanimously by the annual meeting of the Association. The leading members of the various Associations which represented the interests of company-owned undertakings in gas, water, tramways, and electricity supply were equally of opinion that the Joint Industrial Councils representing these industries should include in each case both municipal and company-owned undertakings.

Steps were therefore taken to hold preliminary conferences of representatives of the Employers' Associations (both municipal and company) and of the trade unions concerned in these four industries; and each of these preliminary conferences appointed a provisional committee to draft a constitution for the proposed Joint Industrial Council. Constitutions were drafted in each case. The first meeting of the Joint Industrial Council for the water-works undertakings industry was held on April 3; and it was hoped that the first meetings of the Joint Industrial Councils for the electricity supply, gas, and tramway industries would be held in the near future.

There remained the question of dealing with the non-trading services, and with the administrative, technical, and clerical staffs of local government authorities. A Provisional Committee, representing the Association of Municipal Corporations, the County Councils' Association, and Urban Districts Councils' Association, the Rural District Councils' Association, and the London County Council and the trade unions concerned, was formed to draft a constitution for a Joint Industrial Council for the non-trading services. This constitution was drafted, and had now been approved by the employers' associations and the trade unions concerned. Steps for the formation of a Joint Council for the administrative, technical, and clerical staffs of local government authorities were also being taken, and the process of drafting a constitution has now been proceeded with. It would thus be seen that the principles of the Whitley report were being applied to the whole field of local government activity. It should be noted, however, that at present the Poor Law authorities were remaining outside these developments, and that the position of the asylums services was at the moment uncertain.

#### Constitution Adopted.

After Mr. Wardle's address, the Joint Industrial Council adopted the constitution of the Council which had already been submitted to, and approved by, the constituent associations of employers and workpeople. An Executive Committee was elected, and Sir Harcourt Clare, the Clerk to the Lancashire County Council, and Councillor E. Hallas, M.P., Joint Secretary of the Amalgamated Society of Gas, Municipal, and General Workers, were respectively elected Chairman and Vice-Chairman of the Council.

## SHEFFIELD GAS SUPPLY.

Mr. Ward, a member of the Sheffield Corporation, asked, and Mr. Warlow (the Chairman of the Development Committee) answered, the following questions:

(1) What steps have been taken to remedy the state of matters now existing in Sheffield with regard to the gas supply?—The matter has been brought to the notice of the Company by the Nominee Gas Directors; and it has been discussed at meetings of the Development Committee.

(2) Is it a fact that the pressure of the gas is now, and has been for some time past, below the statutory requirement?—Yes.

(3) Has the Town Clerk been asked to report to the Committee with respect to the present legal position and obligations of the Gas Company regarding the testing of gas; and, if so, has his report been considered by the Committee?—Yes. The report will be considered by the Committee at their next meeting.

(4) Have any steps been taken to ascertain whether the present method of testing gas supplied by the Gas Company is adequate and satisfactory?—Yes, the Gas Examiner has been asked to report; and his report has been received. It will be considered at the next meeting of the Committee.

(5) Are the Committee aware that tests taken by gas experts in the city show results different from those taken by the Gas Examiner; and, if so, can any explanation be given?—The Committee are generally aware that other tests are, and have been, taken, and that the results are claimed to be different from the results obtained by the Gas Examiner. The whole question of the gas supply is under the consideration of the Committee, who realize the importance of the matter, and at the same time recognize the difficulties of the Gas Company.

**Tavistock Gas Company.**—The annual meeting of the Tavistock Lighting, Coal, and Coke Company, Ltd., was held on the 8th inst., Mr. T. Doidge presiding. The report and accounts submitted showed that the sales of gas during the past year had increased by 5 p.ct., and that the amount received for residuals had been very satisfactory. The credit balance of the profit and loss account was £1051; and the Directors recommended a final dividend of 3s. 4d. per share on the original capital and 2s. 4d. per share on the additional capital, free of income-tax.

## GAS APPLIANCES AT THE NATIONAL KITCHEN AT GLASGOW.

An interesting innovation as far as Glasgow is concerned has been in operation for about five weeks, and is proving very successful. Glasgow—usually among the first in all things—was belated in arranging their National Kitchen; and many doubts existed as to whether it should be introduced under the auspices of the Corporation, or left to private enterprise. The Glasgow Corporation have, however, had good cause to congratulate themselves, as the public support given since the opening day has already led to the introduction of further appliances to cope with the demand; and the practice has abundantly justified itself from a commercial point of view.

The main object of the scheme was, of course, to give proper facilities for adequate feeding arrangements for the general public, and to supply good food at a reasonable figure. To this end, an installation was made of gas appliances in spite of a strong tendency to favour electrical apparatus; and the results already obtained have justified the decision in favour of gas. The appliances installed include the following:

Four large Glasgow cookers.
Corporation hotplates.
Circular fish fryers.
Vegetable or pudding steamers.
One cast-iron gas-heated hot closet.
Thirty gallon boilers, with rustless cast-iron pans.
Sixteen gallon boilers with wire baskets.
Thirty gallon water jacketed boilers.
Ten gallon copper water boilers.
Two gallon coffee urns.
Three gallon tea urns.
Three small bain-marie or counter heaters.
An instantaneous water-heater, giving six pints of boiling water per minute.

The majority of these appliances are of standard type, and well understood in the trade. They have proved most satisfactory in actual work, and are the size most convenient for women to work.

It may be noted that all the appliances mentioned were supplied, and the fixing work undertaken, by the Glasgow Gas Department.

**Woodall-Duckham Verticals for Dunfermline.**—The Gas Committee of the Dunfermline Town Council have had their recommendation approved by the Council, to instal Woodall-Duckham vertical retorts at an estimated outlay of £47,919 complete. The Committee have established a rent of 4s. a year for all cookers supplied from the gas department. A large number are now in use, both at Dunfermline and Rosyth.

## LEEDS GAS-WORKS AND DURHAM COAL.

Much concern is, says the "Yorkshire Post," felt by gas consumers in Leeds—especially large industrial users—at the prospect of a further considerable rise in price, unless an alteration is effected in the system of national control, under which Yorkshire coal is now being diverted to the South, and Durham coal has to be accepted in Leeds for the making of gas. It has already been pointed out that the extra expense thereby entailed, not only in transit, but from the fact that Durham coal is of inferior quality for gas manufacture, is very considerable, amounting in the aggregate to £39,000 a year, or the equivalent of 4d. per 1000 c.ft. Members of the Gas Committee in Leeds have recently had two interviews with the responsible officials of the Coal Control in London; and though no immediate remedy is promised, it is evident that the authorities have been much impressed by the case presented to them, and that at the earliest possible moment the Leeds Gas-Works will be allowed to revert to the use of coal which is raised, so to speak, at their own doorsteps.

A report on the visits of the deputation has now been issued. The members were received by Mr. J. S. Hindley, then in charge of inland supplies. Alderman Penrose-Green, the Chairman of the Committee, pointed out that Durham coal cost 7s. 3d. per ton more than Yorkshire coal, amounting in a year to the figure already stated. He pointed to the waste of traffic involved in the diversion of Yorkshire coal. One large colliery, he said, in direct connection with the Leeds works, could make four or five journeys a day with each truck; whereas probably the same colliery company would be sending its coal to other sources averaging a fortnight per journey. Moreover, now that the menace at sea no longer continued, it was felt that Durham coal could be sent, as before, by water. But Mr. Hindley met this by saying that the freight rates were almost prohibitive—17s. per ton, as against 3s. before the war. The Alderman further pointed out that the greater number of the Leeds retorts (from 60 to 70 p.ct.) are inclined, and are, therefore, not suitable for the carbonization of Durham unscreened coal. In pre-war times it was the practice to purchase specially selected nuts for this plant. The present price of gas, he added, was almost prohibitive for commercial purposes; and any advance (which the Committee would be reluctant to make) would have the effect of causing manufacturers to revert to a cheaper form of fuel. Consequently, the output would be seriously decreased, and, standing charges being the same, the price would have to be still further adjusted.

Alderman G. Ratcliffe made the additional point that, if the supplies of Durham coal were continued, the extra cost, added to the deficit of £74,517 that would accrue by the end of March, 1920, would be equal to an increase of 7d. per 1000 c.ft. Aldermen Thaxton and Brown also spoke; and the General Manager (Mr. C. S. Shapley) added that there was considerable waste in Leeds from the use of Durham coal—a waste of 800 c.ft. per ton—owing to the fact that the Leeds retorts are not designed for this class of coal. The price of coal had risen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from 10s. 2·9d. in 1913 to 22s. 7d. in March, 1919; and under the present deliveries this would be further increased to 26s. 5d. for the year ending March, 1920.

Mr. Hindley, speaking for the Coal Controller, replied that, owing to national circumstances at the moment, there could be no change in the policy of the control, but that the position might be easier in a month's time, when the household stocks of the country were in a better position. He stated that he was in full sympathy with the Leeds case; adding that at present Yorkshire was not raising sufficient coal to serve herself, and that it was the considered opinion of the Department that Durham should not supply Yorkshire with coal for a moment longer than was necessary—Durham coal being required for shipping purposes.

Later, Alderman Ratcliffe and the General Manager had a second interview with the Department, when they were brought into touch with Mr. E. H. Davies, who in the meantime had taken over charge of inland supplies. Mr. Davies assured the deputation that he intended to do everything possible to improve the position of Leeds. Within the next few days he would have the scheme of distribution before him, and go thoroughly into the matter with Mr. Hindley, with a view to seeing whether it was not possible to divert more Yorkshire coal to Leeds. The position would be much clearer in a short time.

## BYE-PRODUCT COKING IN INDIA.

In the course of a paper on the "Industrial Development of India, with Special Reference to the Chemical Industries," read before the Manchester Section of the Society of Chemical Industry, Mr. H. N. Morris referred to the status of the coking industry in India.

The Bengal Steel and Iron Company had two batteries of 34 Simon-Carvés coke-ovens, of a productive capacity of 80,000 to 100,000 tons per annum. This capacity would be doubled when the extensions now under construction were completed. The ammonia was recovered in the form of sulphate. About 2500 tons of tar were produced; and the benzol, if recovered, would be at the rate of 200,000 gallons. These comparatively small quantities could not profitably be refined at the producing works.

At the Sakchi works of the Tata Iron and Steel Company, formed in 1907, when the plant was in full operation, about 1¼ million tons of coal would be consumed, the bulk of which would be coked in 150 13-ton Wilputte coke-ovens, having a coking time of 18 hours. The annual output of bye-products was expected to be 2,300,000 gallons of crude naphtha, 10,000 tons of sulphate of ammonia, and 40,000 tons of tar. Having regard to the large quantities of coal products that would be produced, arrangements were being made to carry out the purification of the benzol, and to engage in the manufacture of coal-tar products generally. At both the works mentioned, the necessary sulphuric acid to deal with the bye-product, ammonia, was being manufactured.

## CURRENT SALES OF GAS PRODUCTS.

### The London Market for Tar, Tar Products, and Sulphate.

London, *April* 14.

There is no change to record in the London tar products market. Pitch still maintains its high tone, and the price is not below 65s. per ton *ex* producers' works. Shipments are being readily made. There are good inquiries for creosote, and the price is from 6d. net per gallon in bulk *ex* makers' works. Other tar products remain unaltered.

There is nothing fresh to report with regard to sulphate of ammonia.

### Tar Products in the Provinces.

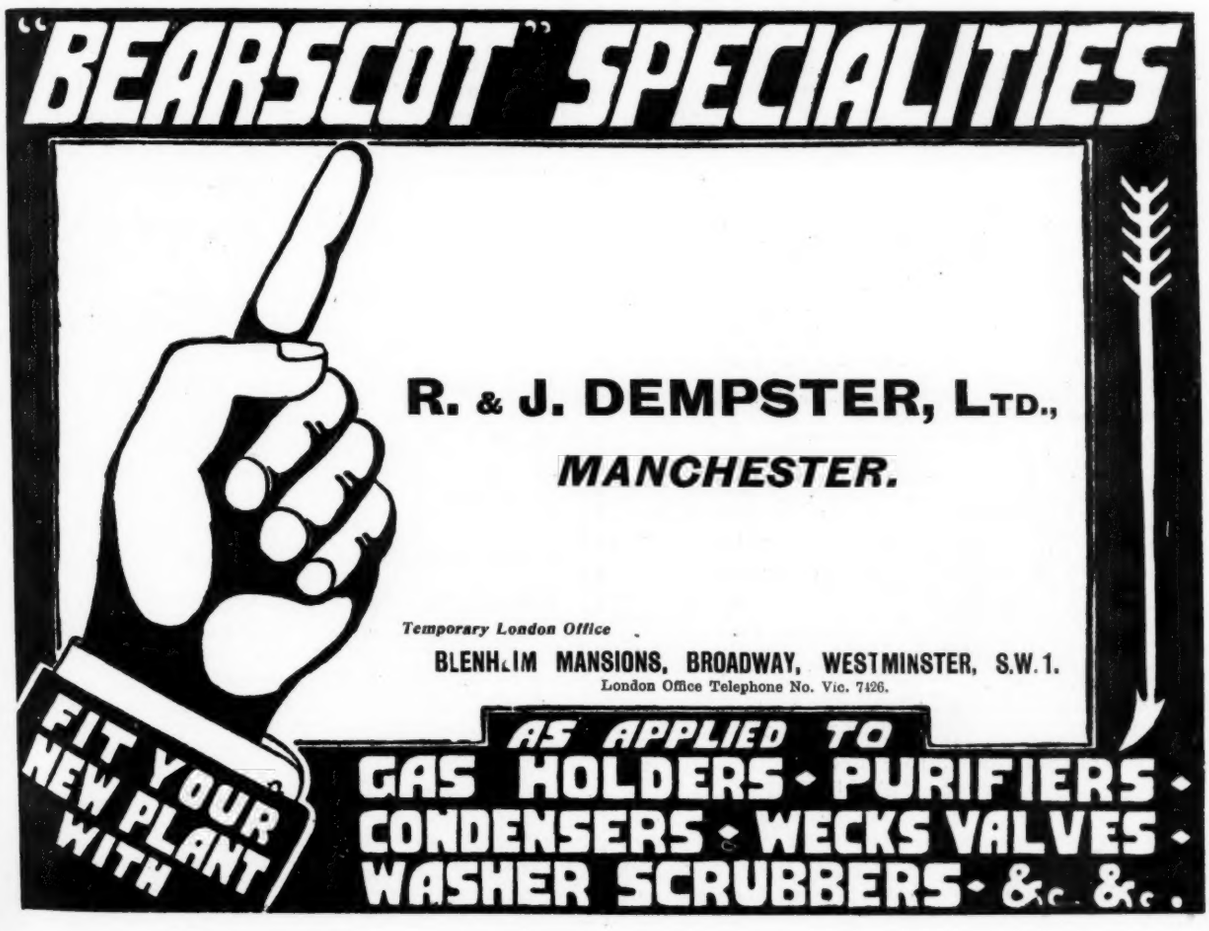
*April* 14.

The average values for gas-works products during the week were: Gas-works coal tar, 34s. 6d. to 39s. 6d. Pitch, East Coast, 51s. 6d. to 52s. 6d. per ton f.a.s.; West Coast—Manchester 44s. to 45s.; Liverpool, 45s. to 46s., Clyde, 46s. to 50s. nominal. Benzol 90 p.ct., North, 1s. 9d. to 1s. 11d.; 50-90 p.ct., naked, North, 1s. 10d. to 1s. 11d. Toluol, naked, North, 2s. to 2s. 1d. nominal. Coal tar crude naphtha in bulk North, 8d. to 8½d. Solvent naphtha, naked, North, 2s. to 2s. 2d. Heavy naphtha, North, 2s. 7d. to 2s. 8d. Creosote, in bulk, North, salty, 4½d. to 5d.; ordinary liquid, 5d. to 5½d. Heavy oils, in bulk, North, 6d. to 6½d. Carbolic acid, 60 p.ct., unsaleable. Naphthalene, £18 to £23; salt, £6 to £7, bags included. Anthracene, "A" quality, 6d. to 7d. per minimum 40 p.ct.; "B" quality, 2d. nominal.

## FROM A MARKET CORRESPONDENT.

### Tar Products.

There is little alteration to be noted during the past week. The market for practically all products is quiet. The only section wherein extreme strength is shown is creosote, which is still expected to reach higher quotations in the near future. At the other end of the list remains carbolic acid; and he would be bold indeed who would dare suggest when this product is likely to be rescued from the slough of despond. No one wants to buy; and the only way out of the impasse seems to be to reduce the make to such an extent that stocks will not be increased but will gradually work-off, and so bring about a revival. Crystals are in no better position; complications being caused by the fact that so many people have dear lots on hand. Crystal is now said to be worth no more than 4½d. per lb. But, of course, stocks have cost holders three to four times this amount; and consequently they are not desirous of selling. Pitch remains about the same; Provincial rates still tending to harden—there being rather more inquiry for road-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making purposes at the moment. Solvent naphtha continues very slack; and there is no prospect of any heavy demand from the rubber industry. The latter buyers are awaiting some definite announcement, as also are a good many other industries, from the Chancellor of the Exchequer with regard to taxation generally. Heavy and crude naphthas are unchanged. Naphthalenes are not much heard of, and prices are no worse. Cresylic acid is rather better. Toluol is dull. But benzol is still finding ready buyers for motor spirit purposes; and there is every reason to anticipate that, when the recently-formed Association commences work in earnest, a very considerable increase in the demand for this purpose will ensue. Other products are without change.

The range of home quotations is as follows:

**Benzol:** 90% London, 2s. 1d. to 2s. 3d. per gallon; 50-90%, 1s. 11d. to 2s. 2d. per gallon.

**Carbolic Acid:** Crude 60's unsaleable; crystals, 40%, 4d. per lb asked.

**Crude Tar:** London, 40s. to 41s.; Midlands, 34s. to 36s.; North 35s. per ton *ex* works.

**Pitch:** London, 65s. to 70s. per ton; East Coast, 49s. to 52s. per ton; West Coast, 45s. to 47s., with Manchester 45s. per ton and Glasgow 47s. 6d. per ton; South Wales, 53s. per ton.

**Solvent Naphtha:** London, 2s. 4d. to 2s. 6d. Provinces average 2s. 3d. per gallon.

**Crude Naphtha:** Naked, 10d. per gallon.

**Heavy Naphtha:** 2s. 7d. per gallon.

**Naphthalene:** Refined, £20 to £22 per ton nominal; crude, £5 10s. to £10, according to quality.

**Toluol:** Naked, 2s. 1d. to 2s. 3d. per gallon nominal.

**Creosote:** London, 7⅞d.; North, 6¾d. to 7d.; heavy oil, 7¼d. per gallon in bulk.

**Anthracene:** 40-45%, 4½d. to 8d. per unit per cwt.

**Grease Oils:** 18° Tw. (naked), £6 per ton f.o.r. makers' works.

**Aniline Oil:** 1s. 2d. per lb.

**Cresylic Acid:** 95%, 2s. 9d. to 3s.; 97-99%, 3s. to 3s. 3d. *ex* works London; f.o.b. other ports.

### Sulphate of Ammonia.

There is no change in conditions to report. Negotiations are taking place with regard to future Government action in reference to fertilizing materials, particularly sulphate of ammonia and nitrate of soda; and I hope to be able to go further into the matter in the next issue. Meantime, it is as well to bear in mind that any general release of nitrate on the open market will probably make available for export a larger quantity of sulphate.

## Gas Supply in Perth (Western Australia).

In the 1917-18 report of the City of Perth (Western Australia), it is shown that progress in the gas department has been greatly hampered by the shortage of material and supplies, much to the inconvenience of customers, many of whom it has been impossible to connect—no new material for extensions or services having been received during the year, except a few meters and stoves. The present manufacturing plant is up to its full output; and the war prevented the ordering of new plant for East Perth, as manufacturers have not been prepared to supply. It is hoped conditions will now soon permit the plant to be erected. Though the effects of the last coal strike were still being felt at the beginning of the year, the output increased by 5·52 p.ct. to 114,512,000 c.ft. Coal supplies have been very bad, both in quality and delivery, causing manufacturing troubles and considerable expense by extra handling. Though complaints are sometimes made of the high charge for gas in Perth, it is not high in comparison with Melbourne and Sydney. The difference in price of coal alone represents 1s. 8d. per 1000 c.ft., whereas the actual charge is only 1s. 1od. per 1000 c.ft. higher, though in Melbourne and Sydney they have many times the output and the most modern and economical plant. In order to assist the shortage of supply, a producer was added to the plant, the gas from which is thoroughly mixed with the gas from the retorts. The outgoing gas averages 500 to 550 B.Th.U. per 1000 c.ft. The gas-works have shown a net working profit of £9652, practically the same as the previous year, though the beginning of the year was materially affected by the last coal strike, and there has been an increase of 2s. 4d. per ton in the cost of coal during the year. The gross profit is sufficient to cover depreciation and interest, but not all the sinking fund chargeable to the gas plant.

**Gas-Workers' Dispute at Tenby.**—The non-granting of a request for increased wages resulted in the scavangers and other labourers engaged by the Tenby Corporation coming out on strike. On Saturday morning, the stokers and other employees of the Gas Company also left their work; and the Company gave notice that gas would not be supplied after noon on Sunday.

**Board of Trade Estimates.**—The amount required by the Board of Trade for the year ending March 31, 1920, as set forth in the Civil Service Estimates, includes a further £500,000 for assistance to the dye industry, together with a re-vote of £1,000,000; while an investment is proposed of £334,046 in British Dyes, Ltd., this being the balance of advances to be made by the Government (limited to a maximum of £1,500,000).

**Price of Gas in Glasgow.**—A recommendation by the Gas Committee that the price of gas should be increased 3d. per 1000 c.ft., making the domestic rate 4s., should have come before the Glasgow Town Council at their last meeting; but before this stage could be reached, there was a count-out. It was proposed that the increase should take effect from the date of the next survey of meters, which begins next Thursday—the date of the next Council meeting. Referring to the count-out, the "Glasgow Evening News" comments: "Are the councillors doing their duty as the elected representatives of the citizens by this dilly-dallying? Surely it is not too much to ask of them that they might maintain a quorum of 37 out of 113 members for longer than 2 hours and 50 minutes!"


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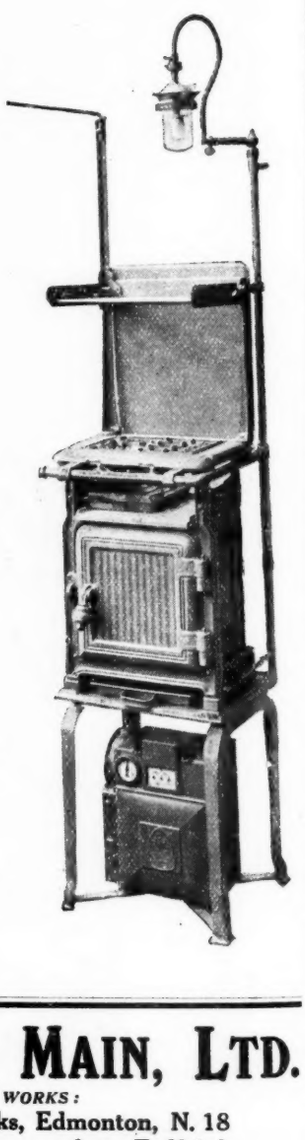

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**Projected Extensions at Eyemouth.**—The Eyemouth Gas Company have found it difficult to give the full supply of gas demanded by consumers, owing to the rapid increase in consumption. They are, therefore, considering the question of erecting a new retort-house.

**A Strike at Montreal.**—Some days ago, there was a strike of 300 employees of the Montreal Light, Heat, and Power Company, to enforce recognition of the union. Fortunately, however, this coercive action did not result in the closing-down of the services, as many of the employees remained at their posts.

**A Rebuff as to Gas Quality.**—The Hunsworth (Yorkshire) Urban District Council concluded their street lighting season on March 31, a month earlier than usual, as a protest against the further increase of 3d. per 1000 c.ft. in the price of gas supplied by the Drighlington Gas Company. The protest was communicated to the Company, with an opinion that the price was excessive, especially considering the quality. At a meeting of the Council last week, the reply was submitted, in which the Gas Manager, in promising that the matters would be brought before his Directors, corrected the Council, remarking that the quality of the gas was not poor, and was now fully equal to anything which had ever been sent out from the works.

**Trim (co. Meath) Gas-Works.**—At a meeting of the Trim Urban Council, the Engineer submitted a report showing that in repairs to the gas-works about £319 would be required for new roofs to the coal and retort houses. He added that unless a certain part of a wall at the retort-house was taken down, he would not undertake the responsibility of fitting the proposed new retorts at the place. He estimated the total expenditure necessary at the gas-works at £800. On the suggestion of the Chairman (Mr. F. C. O'Reilly), the matter was allowed to stand over pending consideration of an electric-lighting proposal.

**Threatened Strike at Goole.**—It was reported on Friday that the whole of the men at the Goole Gas-Works had handed in their notices, which were to expire in a week. They demanded that their working hours should be reduced, and were asked to allow the matter to stand over until the new Council came into office; but they refused. The Council delegated the matter to a small committee. On the following day the announcement was made that a satisfactory settlement had been reached. The men have been granted an additional 3s. 6d. per week war bonus; and the question of working hours is to be settled under the Government award.

## STOCK MARKET REPORT.

THE quickening of the pace of business on the Stock Exchange reported a week ago was fairly well maintained since then on the whole, though not in all markets.

The gilt-edged market had some strong points. In Home Government issues, War Loans were in good demand, the 5 p.ct. touching 96 1/16 on Wednesday, and the tax-free 4 p.ct. being in high favour. War Bonds, too, were much in request. Home Rails, though quiet, were firm nearly until the close. Canadians were in better odour; but Argentines were dull. In the Foreign Market, French Loans had a run of moderate advances; but this was not maintained to the end. Mexicans and Chilians were firm. In Miscellaneous, there was much activity and strength in Oils.

Business in the Gas Market showed a great accession of activity compared with the standard of many past weeks, recorded bargains totalling about cent. per cent. above the score of the preceding week. It also provided a degree of sensation. Imperial Continental changed hands at 115 on Monday. On Tuesday, after marking 116 1/4, it rose by short leaps to 127. Next day it reached 134, and the following day 138; the quotation advancing 18 points. The mainspring of this movement is high expectation of rescuing much of the Company's butter out of the mouth of the German dog. Primitivas, ordinary and preference, were busy, but without change.

Bargains done for cash during the week were as follows: On Monday, Gas Light ordinary 62, 62 1/4, 62 1/2, 62 3/4, ditto debenture 55 1/2, Ilford "A" 90, Imperial Continental 115, 115 1/2, 115 3/4, 116, 116 1/4, 117, Melbourne Bonds 95, 95 1/4, 95 1/2, Primitiva 23s. 6d., 25s., 25s. 7 1/2d., ditto preference 43s. 9d., 44s., 45s., South Metropolitan 62, 63 3/4, 64 1/4, Tottenham "A" 91, ditto "B" 65 On Tuesday, Bombay 6 1/16, Brentford debenture 66, British 30 1/2, 30 3/4, Commercial 4 p.ct. 62 1/2, Continental Union 51 1/4, ditto preference 72, Gas Light ordinary 62 3/4, Imperial Continental 116 1/2, 116 1/2, 117, 117 1/4, 118, 119, 120, 123, 125, 127, Lea Bridge 91, Monte Video 9 3/4, 9 7/8, Primitiva 23s., 23s. 9d., ditto preference 45s., South Metropolitan 62, ditto debenture 55, North Middlesex preference 75, ditto debenture 62, Southend 5 p.ct. 70. On Wednesday, Brentford debenture 66 1/2, Continental Union 50, 50 1/2, European 12 11/16, 12 3/4, Gas Light ordinary 62 1/4, 62 1/2, 62 3/4, 63, Imperial Continental 125, 126, 126 1/2, 127, 129, 130, 130 1/4, 130 1/2, 131, 132, 133, 134, Lea Bridge 91 1/2, Primitiva 25s., 25s. 3d., ditto preference 45s., 47s. 6d., South Metropolitan 62 1/4, 62 3/4, 63 1/4, North Middlesex preference 76, ditto debenture 63. On Thursday, Commercial debenture 52 1/2, 52 3/4, 53, Continental Union 50, 50 1/4, 51, 51 1/2, Gas Light ordinary 62, 62 1/4, 62 1/4, 62 3/4, ditto preference 70 1/2, 71. Imperial Continental 132 1/2, 134 1/2, 135, 135 1/2, 136, 136 1/2, 137, 137 1/2, 138, Primitiva 25s., 25s. 6d., 26s., ditto preference 40s., 40s. 7 1/2d., 41s. 9d., 42s. 6d., 42s. 9d., 43s., 45s., South Metropolitan 62, 62 3/4, 63, South Suburban 77, Melbourne shares 8 1/4, 8 7/16. On Friday, Cape Town preference 7 31/32, 8, Gas Light ordinary 62, 62 3/4, ditto maximum 55 1/2, 57, Imperial Continental 133, 134, 134 1/2, 135, 135 1/2, 136, 136 1/2, 137, 137 1/2, Monte Video 9 5/8, Primitiva 25s. 6d., 25s. 7 1/2d., ditto preference 43s. 6d., 44s. 3d., 44s. 4 1/2d., 45s., 45s. 4 1/2d., South Metropolitan 62, Grays and Tilbury 7 7/8, 7 15/16.

In the Money Market, the position fluctuated from day to day, closing quite easy. The Bank rate is 5 p.ct., as fixed on April 5, 1917.

### ANTE-WAR PRICES AND DIVIDENDS, LATEST DIVIDENDS, AND LAST WEEK'S BARGAINS.

| Issue. £ | Share. | When ex-Dividend. | Ante-War Dividend & Bonus p.c. | Last Dividend. | NAME. | Closing Prices. July 30, 1914. | Present Prices. | Lowest and Highest Prices of Bargains. |
|---|---|---|---|---|---|---|---|---|
| 189,049 | Stk. | Mar. 10 | 4 | 4% | Aldershot 4 p.c. Pref. | .. | 62—67 | .. |
| 1,551,868 | ,, | April 8 | 2½ | 2½% | Alliance & Dublin Ord. | 59—64 | 48—50* | .. |
| 874,000 | ,, | July 10 | 4 | 4% | Do. 4 p.c. Deb. | 76—79 | 61—63 | .. |
| 280,000 | 5 | April 29 | 7½ | 8% | Bombay, Ltd. | 5 7/8—6 1/8 | 5 3/8—6 1/4 | 6 1/16 |
| 50,000 | 10 | Feb. 26 | 16 | 12% | Bournemouth Gas and Water { 10 p.c. | 29—30 | 21—23 | .. |
| 888,110 | 10 | ,, | 7 | 7% | B 7 p.c. | 15—15½ | 10—11 | .. |
| 115,000 | 10 | ,, | 6 | 6/- | Pref. 6 p.c. | 13½—14 | 9—9½ | .. |
| 159,740 | — | — | — | 4% | 4 p.c. Deb. | .. | 66—68 | .. |
| 992,045 | Stk. | Feb. 26 | 14 | 37/- | Brentford A Consolid. | 261—266 | 76—79 | .. |
| 784,920 | ,, | ,, | 11 | 31/8 | Do. B New | 204—209 | 70—75 | .. |
| 55,000 | ,, | ,, | 5 | 5% | Do. 5 p.c. Pref. | 109—111 | 78—83 | .. |
| 221,400 | ,, | June 11 | 4 | 4% | Do. 4 p.c. Deb. | 91—98 | 65—67 | 66—66½ |
| 217,380 | ,, | Feb. 26 | 11 | 7½% | Brighton & Hove Orig. | 208—218 | 137—142 | .. |
| 244,200 | ,, | ,, | 8 | 5½% | Do. A Ord. Stk. | 154—159 | 94—99 | .. |
| 933,500 | Stk. | — | 5 | 5% | Bristol 5 p.c. max. | .. | .. | .. |
| 600,000 | 20 | Mar. 26 | 12½ | 10% | British | 44—45 | 30½—31½ | 30½—30¾ |
| 120,000 | Stk. | June 26 | 4 | 4% | Do. 4 p.c. Deb. Stk. | 88—90 | 64—66 | .. |
| 245,771 | ,, | ,, | 4 | 4% | Buenos Aires 4 p.c. Deb. | 85—87 | 50—53 | .. |
| 100,000 | 10 | — | — | — | CapeTown & Dis., Ltd. | 1½—2½ | 3/4—1 1/4 | .. |
| 100,000 | 10 | — | — | 4% | Do. 4½ p.c. Pref. | 4—6 | 7/8—2 | 7/8—8 |
| 100,000 | Stk. | June 26 | 4½ | 4½% | Do. 4½ p.c. Deb. Stk. | 70—75 | 50—55 | .. |
| 157,150 | ,, | Feb. 26 | 5 | 5% | Chester 5 p.c. Ord. | 108—110 | .. | .. |
| 1,518,280 | ,, | Feb. 12 | 5/9/4 | 30/- | Commercial 4 p.c. Stk. | 106—108 | 62—65 | 62½ |
| 560,000 | ,, | ,, | 5½ | 36/8 | Do. 8½ p.c. do. | 103—105 | 59—62 | .. |
| 475,000 | ,, | June 11 | 8 | 8% | Do. 8 p.c. Deb. Stk. | 69½—71½ | 51—53 | 52½—53 |
| 800,000 | ,, | ,, | 4 | — | Continental Union Ltd. | 76—79 | 48—53 | 50—51½ |
| 200,000 | ,, | ,, | 7 | — | Do. 7 p.c. Pref. | 115—118 | 70—75 | 72 |
| 51,600 | Stk. | Aug. 29 | 14½ | 12½% | Croydon A 10 p.c. | .. | 155—165 | .. |
| 278,400 | — | ,, | 11½ | 9½% | Croydon B and C 7 p.c. | .. | 130—135 | .. |
| 492,270 | Stk. | ,, | 6 | 6½% | Derby Con. Stk. | 128—135 | .. | .. |
| 55,000 | ,, | — | 4 | 4% | Do. Deb. Stk. | 102—104 | .. | .. |
| 1,002,180 | 10 | July 29 | 10 | 6/0 | European, Ltd. | 17½—18 | 12½—13½ | 12 11/16—12 3/4 |
| 16,398,975 | Stk. | Feb. 10 | 4/17/4 | 30/- | Gas Light and Coke { 4 p.c. Ord. | 98—102 | 62—64 | 62—63 |
| 2,600,000 | ,, | ,, | 8½ | 26/8 | 8½ p.c. max. | 76—79 | 55—57 | 55½—57 |
| 4,062,285 | ,, | ,, | 4 | 4% | 4 p.c. Con. Pref. | 96—99 | 70—72 | 70½—71 |
| 4,874,850 | ,, | June 11 | 8 | 8% | 5 p.c. Con. Deb. | 72½—74½ | 56—58 | 56½ |
| 130,000 | ,, | ,, | 10 | 10% | 10 p.c. Bonds | .. | .. | .. |
| 82,500 | ,, | Mar. 12 | 5 | 4½% | Hastings & St. L. 5 p.c. | .. | 50—54 | .. |
| 268,740 | ,, | — | 3½ | 2½% | Do. 3½ p.c. | 37—39 | 44—49 | .. |
| 70,000 | 10 | April 29 | 11 | 6% | Hongkong & China, Ltd. | 10½—10¾ | 7½—8½ | .. |
| 86,600 | Stk. | Sept. 12 | 9 | 8½% | Hornsey 7 p.c. | .. | 115—120 | .. |
| 181,000 | ,, | Mar. 12 | 7½ | 5% | Ilford A and C. | 151—154 | 90—95 | 90 |
| 66,780 | ,, | ,, | 6¾ | 4½% | Do. B | 115—118 | 69—74 | .. |
| 65,500 | ,, | June 26 | 4 | 4% | Do. 4 p.c. Deb. | 92—94 | 62—65 | .. |
| 4,940,000 | ,, | May 14 | 9 | 4½% | Imperial Continental | 150—160 | 130—140 | 115—138 |
| 1,235,000 | ,, | Feb. 12 | 8½ | 8½% | Do. 8½ p.c. Deb. Red. | 84—86 | 72—74 | .. |
| 235,249 | ,, | Mar. 12 | 6½ | 6½% | Lea Bridge Ord. 5 p.c. | 119—121 | 90—95 | 91—91½ |
| 2,498,905 | ,, | Feb. 26 | 10 | 42/6 | Liverpool 5 p.c. Ord. { A | 211—213 | .. | .. |
| | | | | | { B | 146—148 | | |
| 806,088 | ,, | June 26 | 4 | 4% | Do. 4 p.c. Pr. Deb. Stk. | .. | .. | .. |
| 165,736 | ,, | Feb. 17 | 7/5/6 | 32% | Maidstone 5 p.c. | .. | 58—63 | .. |
| 15,000 | 5 | June 11 | 6 | 8% | Malta & Mediterranean | 4½—4¾ | 3½—3¾ | .. |
| 250,000 | 100 | April 1 | 4½ | 4½% | Mets. of { 4½ p.c. Deb. | 99—101 | 90—97 | 95—95½ |
| | | | | | Melbourne | | | |
| 841,980 | 20 | May 26 | 4 | 6/- | Monte Video, Ltd. | 11½—12 | 9 3/8—9 7/8 | 9 5/8—9 7/8 |
| 1,875,899 | Stk. | July 29 | 4½ | 5½% | Newcastle&Gatsh'dCon. | 98½—99½ | 70½—71½ | .. |
| 525,705 | ,, | June 26 | 8½ | 8½% | Do. 8½ p.c. Deb. | 82—88 | 57—59 | .. |
| 55,940 | 10 | Feb. 26 | 1/14/0 | 7½% | North Middlesex 7 p.c. | 14—15 | 9½—9¾ | .. |
| 300,000 | Stk. | May 14 | 8 | 8% | Oriental, Ltd. | 117—123 | 103—106 | .. |
| 60,000 | 5 | Mar. 26 | 10 | 1/- | Ottoman, Ltd. | 7½—7¾ | 4 3/8—5 1/4 | .. |
| 60,000 | 50 | Feb. 26 | 18 | 7½% | Porto Rico, Island | 128—131 | 76—81 | .. |
| 100,000 | 50 | ,, | 12 | 6½% | Do. C | 116—121 | 68—73 | .. |
| 249,980 | 5 | April 29 | 8 | — | Primitiva Ord. | 6¾—8 | 1—1½ | 23/—26/- |
| 499,960 | 5 | June 26 | 5 | — | Do. 5 p.c. Pref. | 4¾—5 | 2—2½ | 40/—47/6 |
| 621,600 | 100 | June 9 | 4 | 4% | Do. 4 p.c. Deb. | 91—93 | 74—76 | .. |
| 600,000 | Stk. | July 31 | 4 | 4% | Do. ,, ,, 1911 | .. | 46—49 | .. |
| 846,198 | ,, | June 26 | 4 | 4% | River Plate 4 p.c. Deb. | 85—87 | 48—52 | .. |
| 150,000 | 10 | May 14 | 6 | 6/- | San Paulo { 6 p.c. Pref. | 10½—11 | 7½—8 | .. |
| 125,000 | 50 | July 1 | 5 | 5% | { 5 p.c. Deb. | 47—49 | 40—42 | .. |
| 185,000 | Stk. | Mar. 12 | 10 | 5% | Sheffield A | 223—224 | 83—85 | .. |
| 209,984 | ,, | ,, | 10 | 5% | Do. B | 223—224 | 83—85 | .. |
| 523,500 | ,, | ,, | 10 | 4¾% | Do. C | 220—222 | 82—84 | .. |
| 133,201 | Stk. | Sept. 12 | 4 | 4% | Shrewsbury 5 p.c. | .. | .. | .. |
| 90,000 | 10 | May 26 | 9 | 6/- | South African. | 10½—11½ | 13—14 | .. |
| 6,609,895 | Stk. | Feb. 10 | 5/4/0 | 30/- | South Met. 4 p.c. Ord. | 111—113 | 62—65 | 62—63½ |
| 250,000 | ,, | July 12 | — | 5% | Do. Pref. | .. | 95—97 | .. |
| 1,895,445 | ,, | July 10 | 3 | 3% | Do. 3 p.c. Deb. | 72½—74½ | 54—56 | 55 |
| 224,890 | ,, | Feb. 26 | 5 | 5% | South Shields Con. Stk. | 157—159 | 112—114 | .. |
| 959,795 | ,, | ,, | 3½ | 3½% | S'th Suburb'n Ord. 5 p.c. | 114—116 | 76—79 | 77 |
| 187,658 | Stk. | June 26 | 5 | 5% | Do. 5 p.c. Deb. Stk. | 116—118 | 89—92 | .. |
| 647,740 | ,, | May 14 | 3 | 3% | Southampton Ord. | 99—102 | 69—71 | .. |
| 120,000 | ,, | Feb. 12 | 7½ | 4½% | Tottenham { A 5 p.c. | 135—138 | 90—95 | 91 |
| 782,275 | ,, | ,, | 6 | 3% | District { B 3½ p.c. | 115—117 | 65—67 | 65 |
| 181,255 | ,, | June 26 | 4 | 4% | { 4 p.c. Deb. | 87—89 | 64—66 | .. |
| 182,880 | 10 | Dec. 30 | 5 | — | Tuscan, Ltd. | 5—6 | 1—2 | .. |
| 149,900 | 10 | July 1 | 5 | 5% | Do. 5 p.c. Deb. Red. | 92—95 | 45—50 | .. |
| 296,476 | Stk. | Mar. 12 | 5 | 5% | Tynemouth 5 p.c. max. | 103½—109 | 83—85 | .. |
| | | | | | Wandsworth, Wimbledon, and Epsom— | | | |
| 80,000 | ,, | Feb. 26 | 8¾ | 55/- | Wandsworth A 5 p.c. | 151—156 | 88—93 | .. |
| 256,636 | ,, | ,, | 6¾ | 40/- | Do. B 3½ p.c. | 129—134 | 68—73 | .. |
| 108,075 | ,, | ,, | — | 38/6 | Do. C | .. | 68—73 | .. |
| 140,865 | ,, | ,, | — | 38/6 | New Ordinary | .. | 68—73 | .. |
| 852,000 | ,, | ,, | 6½ | 33/9 | Wimbledon 5 p.c. | 117—122 | 64—73 | .. |
| 98,000 | ,, | ,, | 6¾ | 40/- | Epsom 5 p.c. | 121—126 | 70—75 | .. |
| 88,416 | ,, | June 26 | 3 | 3% | 3 p.c. Deb. Stk. | 66—69 | 50—52 | .. |

* Ex div.

## Proposed Electric Light Extension at Cheltenham.

On Monday of last week, at a meeting of the Cheltenham Town Council, Alderman Green moved the adoption of the minutes of the Electricity and Lighting Committee, which included a recommendation that application be made to the Local Government Board for a loan of £26,000, for completing the lighting of the town by electricity. Mr. Moore, in seconding, remarked that the Corporation were in the hands of the Gas Company with regard to the lighting of a large number of their streets. Recently they had had a conference with the Company on this subject; and so far as the Council were concerned, it was a most unsatisfactory conference. They were simply told that the Company's charge in future was to be £10 per lamp, and that they could take the contract or leave it. This was not a spirit which the Council ought to put up with. The remedy lay in their own hands. They had simply to put down electric cables and erect electric standards in the streets not already so dealt with. He believed that, if this were done, they would be able to provide lamps at £4 each less than the Gas Company's charge, while at the same time they would be able to do with a much smaller number of lamps than would be necessary in the case of the gas service. A further advantage gained would be that the Corporation would be placed in a position to supply practically every house in the town with electricity, and thus considerably to increase the revenue of the undertaking. The minutes were adopted.

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The Lighting Committee of Arbroath, before considering the question of the renewal of street lighting by electricity, have decided to obtain a statement as to the cost of lighting by gas.

A meeting of Unionists of St. Mary's Ward, Birmingham, "is of opinion that, in view of the shortage of coal and the heavy expense, the illuminating of the Town Hall and Council House should be omitted when peace is celebrated, but that fireworks in the parks would be preferable."

A Swiss agent desires to represent United Kingdom manufacturers of gas apparatus. British firms may obtain the name and address by applying to the Comptroller-General, Department of Overseas Trade (Development and Intelligence), No. 73, Basinghall Street, London, E.C.2—quoting Switzerland, No. 646.

Major F. Cornelius-Wheeler, who (prior to military service) was responsible for designing and executing important decorative schemes for some of the largest west-end and country mansions, has joined the staff of the Nautilus Fire Company, Ltd., and his services will henceforward be at the disposal of gas engineers and other officials for the designing and planning of gas show-room schemes, in which work the Davis Gas-Stove Company, Ltd. (the proprietors of the Nautilus Fire Company), have specialized for several years and are about to develop largely.

After having, as recorded on p. 108 of last week's "Journal," been on strike for a week, during which time the town has had only two hours' supply of gas each evening, and none during the day, the Cowes gas-workers returned to work on Saturday.

Mr. E. C. Brierley, for some years a representative of Messrs. R. & A. Main, Ltd., of London, has been appointed by Messrs. Thomas Glover & Co., Ltd., to assist Mr. William Batt, the Manager of their Manchester branch. Mr. Brierley held the rank of Sergeant in the 20th London Regiment, and saw active service in France, Salonica, Egypt, and Palestine—taking part in the great success of the British troops under General Allenby from Beersheba in the south to Damascus in the north.

The Chemical Engineering and Wilton's Patent Furnace Company, Ltd., have just secured a repeat order from the Glasgow Corporation for a complete sulphate of ammonia plant for treating 30,000 gallons of ammonia liquor per day, to be erected at their Dalmarnock station. It is to be similar to the one they fitted in 1914. The Company have also had ordered by the Chertsey Gas Company a complete two-ton per day sulphate plant. Other plants they have designed and are erecting in Edinburgh and London are for extracting sulphate of ammonia from the waste gases evolved in the manufacture of waterproof canvas; each plant being capable of producing about half-a-ton of sulphate per day from what was formerly a waste gas.

The report of the Gas Lighting Improvement Company for the year ended Dec. 31 shows a net profit of £47,182, from which has to be deducted the year's dividend on the preference shares and interim dividends on the ordinary and founders' shares, leaving £44,781, which added to the amount brought forward makes £89,766. The Directors recommend a further dividend for the year at the rate of 12½ p.c. on the ordinary shares and 37½ p.c. on the founders' shares, and in addition a bonus of 2½ p.c. on the ordinary and 7½ p.c. on the founders' shares, making a total of 17½ p.c. and 52½ p.c. respectively for the year, and leaving £81,661 to be carried forward, subject to additional remuneration to Directors and provision for excess profits duty. The amount standing at the credit of the reserve account at the end of 1918 was £35,000. A considerable portion of this is now being applied to extensions of the business, with the result that it will be permanently absorbed into the capital. The Directors recognize that reserves so applied should be capitalized and distributed in the form of fully-paid ordinary shares. They propose, therefore, to deal in this way with £31,016 of the reserve, and take the opportunity of getting rid of the founders' shares. It is further proposed to increase the capital of the Company by creating 150,000 new ordinary shares of £1 each, making a total authorized capital of £250,000. This increase will provide shares to be issued for cash to carry out the purchase of additional premises and for the extension of the Company's business, and will leave a reserve of shares for future issue in case of necessity.

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